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CHANGES OF THE SEA FISHING INDUSTRY

OF SOUTHERN ENGLAND

SINCE THE SECOND WORLD WAR

TREVOR DAVID KENNEA, M.Sc.

T.D. Kennea

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ABSTRACT

When compared with the sea fishing industry in the country as a whole, that of the south of England is seen to consist of a disproportionately large number of small operational units; part-time fishermen play relatively a greater part in the south than nationally and much fishing by the owners of small boats continues only because of the support provided by tourists in the summer and the "dole" in the winter.

The largest landings of both wet and shellfish have been made consistently in Devon and Cornwall and, although most plaice have been taken in Rye and Hythe Bays by boats from south Kent and Sussex, there are few other important grounds in the eastern part of the area and even the oyster production of Whitstable has declined almost to insignificance.

In general terms, the post-war period has witnessed an overall reduction of activities despite a recent revival in some sections. Fortunately, the economic vulnerability of the contracted industry has been lessened by improved fishing techniques, an increasing degree of rationalisation, particularly in marketing, the demise of many uneconomic operating units, the recruitment of younger fishermen and, possibly, improved stocks of some fish. It is to be expected that in the future the industry will show some limited expansion, although no revolutionary changes can be foreseen unless they are based on the exploitation of fisheries well outside the areas at present worked.

PREFACE

It is clear that few satisfactory guides to the future can be obtained without recourse to the past, but one is bound to ask if this is adequate justification for an examination of the post-war changes which have affected a section of the British fishing industry. Do the alterations in themselves justify study?

The answer is that they do, if only on the grounds that many of the changes in emphasis upon the types of fish caught and in the techniques of fishing and marketing employed are sufficiently important to warrant documentation. It might be added that, as most fisheries' research has been primarily in the realms of biology, allied work in other disciplines provides a necessary adjunct before a complete analysis can be made.

The area chosen for study lies to the south of a line between the Thames estuary and the British Channel; there is a considerable variety in the fishing activity here and most is classified as "inshore". In some senses, the activities at smaller fishing centres reflect, in microcosm, those at the more important ports of the country; this is particularly so with general fishing techniques and overall marketing methods. In detail, however, there are considerable differences and the inshore fishing industry has faced and will continue to face manifold difficulties associated with the operation of relatively small-scale enterprises.

There are fairly comprehensive relevant statistics¹ to cover the whole of the post-war period, but other information is much more readily available for the last five or six years than for the preceding period. This is not surprising as many of the pertinent details have never been documented and human memories tend to fade. An examination of past editions of Fishing News² and of the Quarterly Reports of the Fishery Officers of several of the Sea Fishery Committees has yielded much of value, but some degree of imbalance has been unavoidable in the thesis.

While preparing this work, I have received help from a wide variety of sources; in all cases it has been given most generously. My thanks are due to the many representatives of the various sections of the fishing industry, without whose assistance this volume could never have been completed. I include the District Fishery Officers at Hastings and Plymouth, the Fishery Officers at Brixham and Newlyn and members of the scientific, statistical, press section and library staffs of the Ministry of Agriculture, Fisheries and Food, the Fishery Officers of all the Sea Fishery Committees in the area and the Chairman of the Cornwall Sea Fisheries Committee, the Area Officer at Plymouth for the White Fish Authority, the Assistant Secretary of the Fisheries Organisation Society Ltd. and the Director of the Marine Resources Research Unit, Portsmouth.

In addition, I wish to record my appreciation of the work of Mrs. V. Dean, who typed the final manuscript, of Mr. G. Petre, who assisted with the production of the cartographic material, of my colleague, Mr. J. Rooney, who prepared much of the photographic material, and of

the Librarian and library staff of Hendon College of Technology. It is impossible to assess the indebtedness to my wife who, in addition to enduring nearly five years of agony while this work was in preparation, assisted in a practical way by advising, proof-reading and typing.

Finally, I gratefully acknowledge the financial help provided by the London Borough of Barnet (and formerly the Middlesex County Council) for my tuition fees at the London School of Economics and Political Science and from the Central Research Fund of the University of London towards the cost of one of my field expeditions.

1. Sea Fisheries Statistical Tables. H.M.S.O. Published annually.
2. Fishing News is published weekly for the fishing industry by Arthur J. Heighway Publications, Ltd.

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CHAPTER 1

INTRODUCTION

Since the war, the average annual value of all fish landed in southern England by British vessels has been approximately £1,000,000. In only six years during this period have there been variations of more than £100,000 from this figure, but the value of the pound has declined considerably and the significance of the catch has been reduced. In 1946 and 1965 the value of the total catch made by British vessels in England and Wales was £29,507,000 and £41,531,000, respectively.

The region has contributed, in an average post-war year, just under 3% by value of the total catch brought ashore by British vessels at all English and Welsh ports. Nevertheless, the region is of rather greater importance than these figures suggest because of the differing composition of the southern English and national catches. For the country as a whole, shellfish constitute about 3% by value of the annual landings, while for the southern area the corresponding figure is approximately 25% and, what is more, represents some 25% of the value of all shellfish landed in England and Wales.

The average annual value of wet fish landed in the region by British vessels since the war has, at just under £800,000, comprised 2.3% of the English and Welsh total. The catch has in the last few years been divided by weight almost equally between pelagic and demersal fish (Fig. 1) which, as the names imply, are those which spend much of their lives respectively in the upper layers

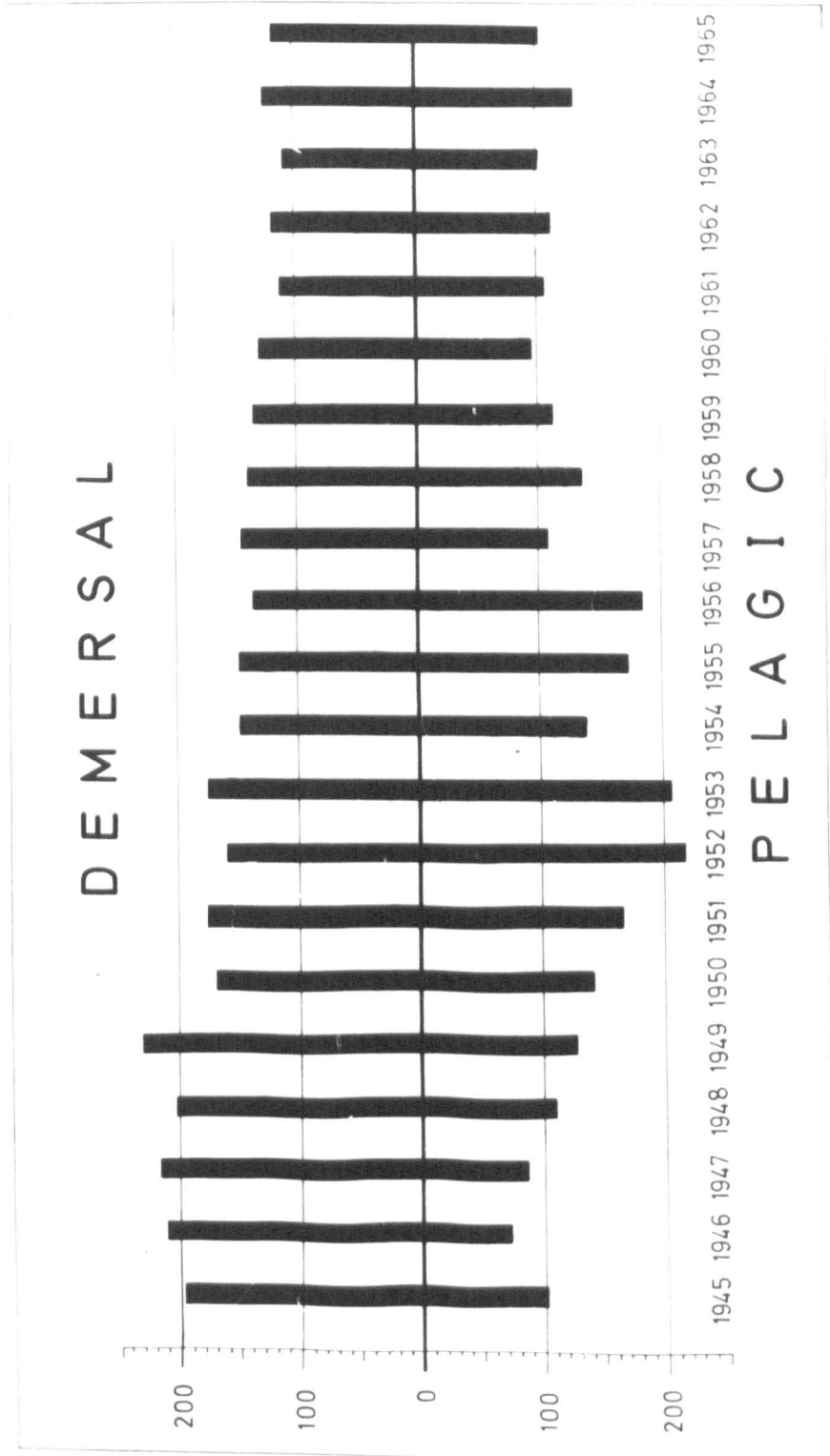


FIG. 1 Landings of wet fish, separated into demersal and pelagic types, made in southern England by British vessels during each year 1945 - 1965.
Scale in 000's cwt.

of the sea and in the waters on or near the seabed. In the southern area the most important types in the former group are mackerel, pilchard and sprat; they are caught principally in drift-nets, in trawls and on lines. Demersal fish include plaice, soles, whiting, cod and skates and rays, and by far the largest proportion of the catch is taken by trawling, although line fishing is also practised.

Each pelagic type tends to congregate in large and almost exclusive shoals and forms the object of a distinct fishery. Catches often contain no other kinds of fish. When one demersal species is the primary object of a fishery, because it is known to gather on a particular ground and at a certain time of the year, it will probably be predominant in the catch which, however, is likely to contain a wide variety of fish.

The lower average value per unit weight of the pelagic fish has meant that they have been much the less important of the two types. Since the war there have been considerable fluctuations in the demersal : pelagic ratio and these will be dealt with in greater detail at a later stage. Nevertheless, it may be mentioned here that the general pattern to-day is considerably different from that of the later 1940's when the average annual weight ratio was approximately 2 : 1 in favour of demersal fish. At all times since the war the proportion has differed considerably from that for England and Wales where it was about 5 : 1 after the war, is currently 13 : 1 and has been in excess of 20 : 1. Throughout the post-war period the

most productive areas in the south of England have been off the south-west peninsula and at least 70% by value of the landings have generally been made in Devon and Cornwall.

At the end of 1965, there were some 1,000 fishermen operating in the area full-time and just under 2,000 part-time. The numbers for England and Wales were 11,000 and 4,000 respectively, so that the fishing labour force employed in the south is disproportionately large in relation to the importance of the catch. This is particularly so with part-time fishermen, largely because of the importance of the holiday trade in providing employment for fishermen and their vessels during the summer. Further, at a number of centres where alternative full-time work is available, many men work ashore and fish during the evenings and weekends; Portsmouth, for instance, has a fleet of over 60 small registered fishing boats, none of which is operated on a full-time basis.

The considerable number of full-time fishermen may be justified largely on the grounds that the small vessels predominant in the region are, compared with the larger boats at the major centres, less economic in their use of labour. They are also less efficient fishing machines, but the cost of operating one of them is considerably lower than that of running one of the larger craft. Nevertheless, the net result for the full-time fishermen in the south of England is that their income from fishing is below that of their counterparts at the more important ports. There are several factors which must be considered, however.

Firstly, many of the full-time fishermen have additional sources of income, usually provided by their wives, from catering for the tourist industry. Secondly, "full-time" fishing at the major ports of the country is rather different in several respects from the activity of the same name conducted in the south, where many of the vessels are small and, often due to bad weather, spend a significant proportion of their time away from fishing; during such inactive periods incomes are augmented by the "dole"*. Finally, it must be remembered that there is a lack of alternative industries to which men may turn, except in the south-east, and even here there are few significant employers in or near most fishing centres. Consequently, unless fishermen wish to move elsewhere, their chances of obtaining a higher income are usually small. Not unnaturally, many have no desire to leave their local area whatever the advantages. This is particularly so with older men, of whom there is probably a large proportion in the southern fishing industry.

The percentage changes since the war in the number of full-time fishermen employed in the region have broadly corresponded to those in England and Wales. In 1948, when full-time employment in fishing was at its post-war peak, the number of men in this category was 26,000 in England and Wales and about 2,400 in the south of England; for

* It was not until the 5th July 1948 that fishermen became eligible for Unemployment Benefit, following the publication of the National Insurance (Mariners) Regulations, 1948. Under the National Insurance Act, 1946, fishermen were not classed as "employed" although the Minister was given power to make regulations to modify the provisions of the Act in their relation to persons employed in any ship or vessel.

both areas the present level is approximately 40% that of 1948. In Devon and Cornwall there were about 1,300 full-time fishermen in 1948 compared with 615 in 1965; the corresponding reduction in the remaining counties was from 1,045 to 408. The percentage decline in the south-east is slightly greater but it is in the detailed pattern of the alterations that the most significant differences between the regions are seen; by 1952 the number of full-time fishermen had fallen to 430 (but was 493 in 1953) in the south-east, the corresponding figure for the south-west was 1,217. The sharp decline during the late 1940's and early 1950's in the counties of Kent, Sussex, Hampshire and Dorset is indicative of initial post-war overstaffing, perhaps by men who joined the industry from the forces, having little or no previous experience of fishing but regarding it as a more attractive form of occupation than was available in factories and offices. One would expect a higher proportion of such men in the south-east than in the less populous south-west.

The administration of the southern sea fishing industry is largely the responsibility of five local Sea Fisheries Committees and of two national organisations, the Ministry of Agriculture, Fisheries and Food and the White Fish Authority. In addition, the Royal Navy sometimes provides patrol vessels to protect territorial fishing rights. The Herring Industry Board, which performs a similar function to that of the White Fish Authority, but for a different section of the industry, is not represented in the region.

The various beaches, harbours, and other inlets are administered by local Councils and bodies as diverse as River Boards, private companies, British Rail, the Duchy of Cornwall and the National Trust. Charges are usually made for facilities provided.

The principal functions of any of the Sea Fisheries Committees and, in so far as they affect the fishing industry of the area, of the Ministry and the White Fish Authority, are distinct and separate. In practice, there is a certain amount of overlap and, inevitably, a considerable degree of co-operation between the representatives of the various organisations.

The Sea Fisheries Committees were inaugurated as a result of the Sea Fisheries Regulation Act, 1888. At the same time, the territorial waters of England and Wales were divided into Sea Fisheries Districts, each under the jurisdiction of one of these Committees. In order to assist with the regulation and protection of the fisheries in their areas the committees have powers to make by-laws which, however, require ministerial confirmation before becoming official, and to enforce these as well as the provisions of certain Acts relating to sea fisheries. To help the committees in the practical performance of their functions, and to provide a means of liaison between the fishermen and themselves, each employs a Fishery Officer who may have assistants at several centres in the District.

The functions of the representatives of the Fisheries Department of the Ministry of Agriculture, Fisheries and Food* are mainly concerned with reporting to the Ministry on the state of the industry, collecting relevant statistics and advising fishermen on future developments, perhaps after research by Ministry scientists. These representatives are also responsible for the administration of the Orders and Regulations made under fisheries legislation.¹ The principal permanent officials in the region are two District Inspectors of Fisheries, one at Plymouth and the other at Hastings; they also have assistants, often part-time, at several points around the coast.

Much more recent in origin than any of the organisations so far discussed is the White Fish Authority, which was inaugurated on 31st May 1951 following the Sea Fish Industry Act, 1951. Its purpose has been to reorganise, develop and regulate the white fish industry and to keep related matters generally under review. In particular, it is required to have regard to the interests of consumers in a plentiful supply of white fish at reasonable prices.² It was also given power to make loans for providing, acquiring, reconditioning or improving vessels or gear and plants for processing white fish.³ This power was extended under the White Fish and Herring Industry Act, 1953 to include the

* The Ministry of Agriculture and Fisheries before 1955.

making of grants from Exchequer funds towards the cost of new fishing vessels and engines.* ø 2

The work of the White Fish Authority at local level is carried out by Area Officers of whom there are two with responsibility for the region. One has operated from Plymouth since they were first appointed in 1952; he has covered the area between Bristol and Lymington in Hampshire. The remainder of the region is at present overseen by the Officer at Lowestoft, although for a time there was also a representative at Brighton. Much of the work of these representatives is concerned with the local administration of the grants and loans schemes and in this connection they offer advice to fishermen and investigate boatyards. They also help with the development and improvement of handling, processing and marketing of fish as well as other aspects of the catching side of the industry.

Before the post-war changes are studied in detail, it is advisable to set the scene on the post-war period by examining briefly the principal alterations to the industry in the area which were brought about by the conflict. During the war many of the larger British trawlers had been requisitioned for Admiralty use,** this affected few of the vessels operating in the south and those taken were back with their owners soon after the

* For several years these grants and loans were only given in respect of vessels up to 140 ft. in length. This limit was removed following the Sea Fish Industry Act, 1962.

ø Owners of inshore vessels up to 70 ft. in length, and most boats in the southern area are of this type, had been in receipt of grants and loans for similar purposes since shortly after the end of the war, under the provisions of the Inshore Fishing Act, 1945.

** Immediately prior to the war there were approximately 1,000 English and Welsh steam trawlers. Of these, up to 690 were later on naval service at any one time.

war; early in 1946, all but two of the requisitioned Cornish vessels had returned to fishing.⁴

It was evident that there was a need to replace and renovate many of the ageing vessels which constituted the inshore fleet, not only in southern England, but along all coasts. The Inshore Fishing Act, 1945, was intended to help towards this end by providing for grants and loans to be made for the purchase of new boats and the re-conditioning of existing ones.

At that time, it was felt⁴ that greater use might have been made of the Grant and Loan Scheme, particularly by older men who probably held back from doing so because they were unsure whether their sons would make a career in fishing. This uncertainty occurred largely because many young men, having left the area during the war, might not have wished to return to the work of their fathers. Even after the war conscription continued and it was thought by many that this could be a deterrent to the expansion of the industry.⁴ Some deferments were given to fishermen, but the number was small and mainly allocated to the deep-sea section. During the war obstructions had been scattered over the fishing grounds but post-war clearing operations progressed quickly and areas which had not been intensively exploited for nearly six years were reopened.

The principal result was that landings of demersal fish were considerably higher immediately after the war than in 1938; the total quantity of demersal fish caught in the area by British trawlers was 152,512 cwts in 1938 and 196,972 cwts in 1945. The wartime resting of the grounds

was particularly welcome, for signs of overfishing had been evident for some time before the war. The fish were therefore given the opportunity of reaching a greater size and, consequently, immediately full-scale fishing operations commenced relatively large catches of good-sized fish were made. The indications of the improved situation are clearly seen in Table 1.

TABLE 1

Details and results of voyages made by British
1st class vessels fishing in the English Channel
and using demersal catching methods

	<u>1938</u>	<u>1945</u>
No. of landings	6,867	4,509
Average duration of voyages (days)	1.48	1.24
Total landings (000 cwt)	110	160 (approx.)
Catch per vessel per landing (cwt)	16	35 (approx.)
Actual fishing time per voyage in hours (trawlers only)	15.9	9.5

Source: Obtained directly or derived from Sea Fisheries Statistical Tables.

- Notes:
1. Approximately three-quarters of the fish caught in the area are taken from the English Channel.
 2. 1st class vessels include all steam and motor boats of 15 tons gross and upwards.

The landings of pelagic fish, which tend to be more erratic than those of demersal fish, were at a much reduced level immediately after the war due to the diminution of the catches of mackerel and sprats (Table 2).

TABLE 2

Quantity (000 cwt) of pelagic fish landed by British vessels from the English Channel in 1938 and 1946

	<u>1938</u>	<u>1946</u>
Pilchard	46	50
Mackerel	34	7
Herring	27	36
Sprat	31	9
Others	$< \frac{1}{2}$	-
Total	<u>138</u>	<u>102</u>

Source: Sea Fisheries Statistical Tables.

The largest catches of mackerel in the region had been made by steam drifters from east coast ports which fished out of Newlyn during the early part of the year. After the war these vessels did not exploit the south-western grounds until 1948 and the 1946 mackerel landings were therefore at a low level.

In 1938, about 30% of the sprats were caught by small boats employing drift fishing methods from the south Kent and Sussex coast; this fishery was of small importance after the war partly because, from about 1940, the number of sprats in the area was reduced and also because the cost of equipping the fleet with expensive drift nets was not justified by the potential rewards from the fishery. The

sprat fishery at Poole, where the fish were caught in a trawl, produced over 15,000 cwt in 1938; after the war, landings were erratic and, although 12,000 cwt were caught in 1945, the quantity was much lower in the next year.

Pilchard landings had increased slightly between 1938 and 1946 and so also had those of herrings. Some 34,000 cwt of the herring catch of the latter year was taken by larger east coast vessels after the main "East Anglian" season had finished whereas, in 1938, these boats accounted for only 7,000 cwt of the total of 27,000 cwt. Consequently, it is more realistic to compare the 20,000 cwt caught in 1938, mainly by local drift fishing vessels, with the 2,000 cwt taken in a similar manner in 1946. Prior to the war this local herring fishery had been practised at many centres along the south coast. Afterwards, as with the Kentish and Sussex sprat drifting activity, the high cost of re-equipping with the necessary nets barred many men from the fishery, but it is almost certain that the herrings, like the sprats, were not present on the grounds in their former quantities.

The overall importance of shellfish landings in the region was rather less immediately after the war than in 1938. Figures obtained from the Sea Fisheries Statistical Tables show that the values of the catches in 1938 and 1945 were £136,000 and £174,000, respectively,* but this increase obscures the true picture for, over the same period, the unit value at first sale of the principal shellfish showed a considerable rise (Table 3) even allowing for the probable

* Because of inaccuracies in the Tables the actual figures were probably higher, but in broadly the same ratio.

larger size and therefore higher value of the individual fish in the latter year.*

TABLE 3

Value (per 100) of Shellfish landed
in Southern England in 1938 and 1945

	<u>Crabs</u>	<u>Lobsters</u>	<u>Oysters</u>
1945	78s. 6d.	357s. 8d.	38s. 1d.
1938	21s. 8d.	124s. 3d.	16s. 3d.

Source: Sea Fisheries Statistical Tables.

Note: The figures are for the country as a whole but although the values may differ from those obtained in the south the general trends are probably broadly similar.

It was mainly in the east of the area that shellfish catches had suffered; even in 1946, by which time the position had improved markedly over that of the previous year, landings from counties other than Devon and Cornwall were still well below their pre-war level (Table 4).

* As the fisheries had been rested during the war, it is not unreasonable to expect that the average size of fish landed shortly after the war would be greater than that of those caught in 1938.

TABLE 4

Comparison of values (£000) of Shellfish landed
in A. Devon and Cornwall and B. All other
Counties in the Region in 1938 and 1946

	<u>1938</u>	<u>1946</u>
Devon and Cornwall	32	171
Other Counties	104	68
Total	<u>136</u>	<u>239</u>

Source: Sea Fisheries Statistical Tables.

Note: The figure for 1946 does not correspond with the more accurate value of £268,000 obtained from the Statistics Department, Ministry of Agriculture, Fisheries and Food and quoted in Chapter 8. Nevertheless, as all information given above was taken from the same source, it is reasonable to assume that it provides a fair basis for comparison.

The reduction in the quantity of oysters taken off Whitstable was an important factor; at that port, these fish made the principal contribution in value to the shellfish catch, which in 1938 fetched about £80,000 at first sale (and accounted for approximately 80% of the value of all shellfish caught in the area outside of Devon and Cornwall) and in 1946 the corresponding amount was £46,000. Oysters normally spend about five years on carefully tended beds before being ready for the table; during this period imported oysters are laid if stocks become low. In the war years this cultivation was obviously kept to a minimum and the immediate post-war harvests were consequently poor.

The 1946 value of the remaining landings of shellfish²⁶ in the east showed little change from that of 1938, but in the latter year the catch was of smaller significance for the unit values of most fish were higher and the value of money was reduced. Gravesend, where good landings of shrimps were made in 1946, provided one of the few exceptions to the general trend. There was, however, no boost to the landings of lobsters and crabs such as occurred in Devon and Cornwall. It is possible that fishing effort in this area had not reached its pre-war level, and almost certainly obstructions on some shellfish grounds were much to blame. Nevertheless, one additional factor worthy of consideration is that the limited grounds off the eastern part of the south coast did not provide the opportunities for restocking available in the more extensive western areas, particularly as they had also been the scenes of intensive wartime activity.

1. Administration and Organisation of the Sea Fishing Industry in Great Britain. Ministry of Agriculture and Fisheries and the Scottish Home Department. Unpublished. 1954.
 2. Annual Report of the White Fish Authority for year ending 31st March 1953.
 3. Annual Report of the White Fish Authority for year ending 31st March 1952.
 4. Correspondence between Lt. Cdr. W.B. Luard, R.N.R. and the Clerk of the Cornwall Sea Fisheries Committee early in 1946.
-

CHAPTER 2

PORTS AND THEIR FACILITIES

1. The Respective Importance of the Principal Ports

Inertia has been significant in affecting the present distribution of much industrial activity. This is certainly found to be true if the principal fishing centres of the south of England are examined although it cannot be claimed that this consideration has been as important here as at the largest fishing ports of the country. Hull, Grimsby and Fleetwood, for example, came into being to harbour vessels fishing nearby waters; their fleets now obtain most of their catches at a considerable distance from the ports, and one of the principal reasons for their existence has vanished.

Relatively few vessels fishing from southern England operate far from their home ports, and so the presence of fish in the waters nearby continues to be an important locational factor. Nevertheless, inertia has been significant in that ports which had good harbours and well organised marketing and ancillary activities after the war have in the main remained relatively important (despite often having declined absolutely) throughout the period, whereas few ports without facilities have increased in importance to any great extent.

Table 5 shows that five ports, Newlyn, Brixham, Plymouth, Mevagissey, and Folkestone, were among those landing the greatest value of fish in each of the years shown. A further two, Hastings and Whitstable, have been excluded from the table on one occasion only. The value of landings has been used in the table to indicate the relative importance of the different ports, as it provides the best practicable measure for comparison of the catches, which may consist

primarily of either shellfish or wet fish. While this provides a comparison between ports in any one year, comparison between years is more difficult owing to the changing value of fish. An indication of the relative values can be obtained if the figures are viewed in relation to some measure of the alteration in the value of money over the same period.

The Retail Price Index indicates an increase of retail prices between 1945 and 1965 of the order of 100%; this shows that the real value of the total fish landed in the region has been reduced by approximately 55% during the post-war period and considerable decreases in the weight of landings have been experienced, even at ports which have consistently been the principal ones in the region. The real value of the catch at Brixham has been reduced by approximately 60% and that at Plymouth, Folkestone, Hastings and Mevagissey by between 68% and 79%. At Newlyn, the reduction has been relatively small, of the order of 25%.

As in most cases total landings have not been reduced by such large quantities it is indicated that fish prices have not risen as markedly as other retail prices.

The ten principal ports have usually accounted for over 70% of the value of landings made in the region and the remainder of the recorded catch has been made at some 60 other ports and fishing villages. In addition, at a large number of centres the very small catches have not been recorded in official statistics.

Newlyn has held a pre-eminent position throughout the post-war period. In the early years after the war Brixham followed closely behind but, later, although it still maintained second position, the disparity increased and the natural advantages of Newlyn made their effect felt. In the last few years the decline at Brixham has been halted.

TABLE 5

Value (£000) of Landings (including Foreign Landings except for 1965) of all Fish at the Principal Fishing Ports of Southern England

1945		1948		1951		1954	
Newlyn	184	Newlyn	234	Newlyn	287	Newlyn	247
Brixham	136	Brixham	178	Brixham	171	Brixham	138
Plymouth	107	Plymouth	107	Whitstable	105	Whitstable	90
Rye	72	Whitstable	70	Plymouth	104	Plymouth	67
Hastings	70	Mevagissey	57	Mevagissey	64	Mevagissey	44
Mevagissey	69	Beesands	52	Loe	59	Folkestone	41
Folkestone	62	Loe	50	Beesands	45	Beesands	39
Loe	45	Folkestone	47	Folkestone	42	Loe	31
Whitstable	44	Padstow	35	St. Ives	40	St. Ives	23
Ramsgate	36	Hastings	34	Padstow	26	Hastings	22
Others	331	Others	314	Others	234	Others	212
Total	1,156	Total	1,178	Total	1,177	Total	954

1957		1960		1963		1965	
Newlyn	307	Newlyn	292	Newlyn	275	Newlyn	273
Brixham	139	Brixham	137	Brixham	102	Brixham	111
Mevagissey	65	Plymouth	60	Plymouth	50	Plymouth	65
Whitstable	60	Mevagissey	49	St. Ives	47	Hastings	53
Plymouth	57	Whitstable	46	Mevagissey	41	Newhaven	42
Hastings	39	Hastings	32	Hastings	40	Folkestone	37
Folkestone	36	Folkestone	29	Newhaven	38	Dartmouth	32
Loe	35	Dartmouth	27	Dartmouth	33	Mevagissey	29
St. Ives	26	St. Ives	24	Folkestone	24	Newquay	28
Beesands	23	Newhaven	23	Whitstable	19	St. Ives	28
		Beesands	23				
		Loe	23				
Others	289	Others	228	Others	256	Others	354
Total	1,076	Total	993	Total	925	Total	1,052

Source: Calculated from the Sea Fisheries Statistical Tables.

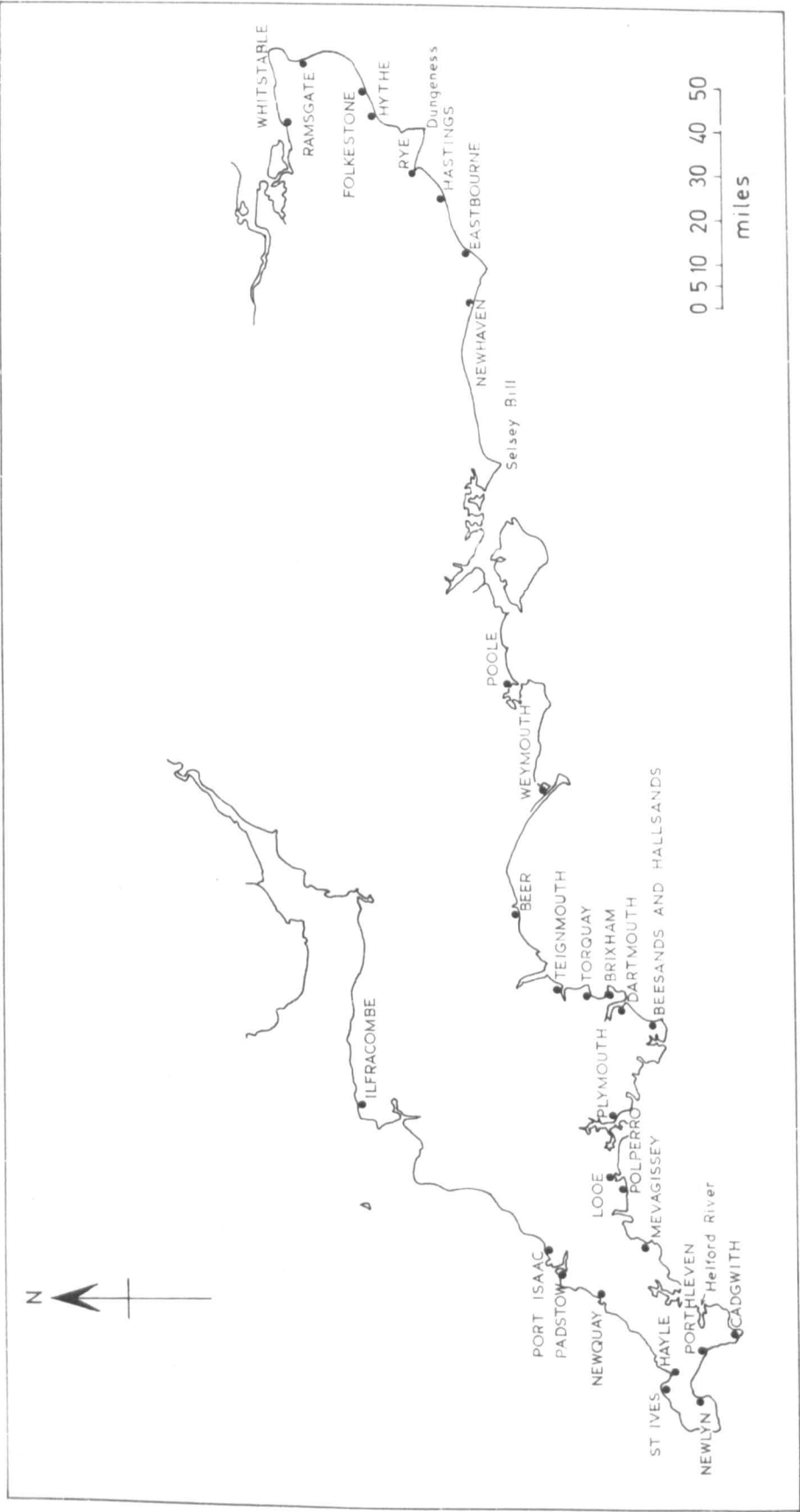


FIG 2 Location of fishing centres in the south of England.

The increasing prosperity of Newlyn as a fishing port has been largely due to the firm of W. Stevenson & Sons, Ltd., which prior to the war was a marketing organisation. Subsequently, the catching side of the business was expanded and for several years the firm has controlled all the larger vessels at the port. No other firms have developed their trawler fleets in this fashion; indeed, many have reduced the number of their vessels, and these sometimes were purchased by Stevensons. The post-war growth of this firm was initially primarily due to its purchase of relatively large and efficient vessels at a time, shortly after the war, when catches were good; this sound grounding was subsequently consolidated by the purchase and operation of further vessels. As the trawlers have all been large, by south coast standards, they have been able to operate on grounds farther afield than those intensively worked by smaller vessels in the region, and to fish in weather when smaller vessels would be compelled to remain in port. Also, some of the best fishing areas around the south coast are off the south-west peninsula and nearer to Newlyn than to any of the other significant ports. An efficient internal organisation has probably been a considerable asset, and this combined with a sound financial basis has accounted for much of the company's growth. The effect of the firm's activities ancillary to fishing must not be underestimated in this respect.

Immediately after the war, a considerable proportion of the landings at Newlyn and Brixham was made by foreign vessels. In 1945 they accounted for 67% by value of the Newlyn catch and 32% by value of that made at Brixham. As

conditions improved on the continent, the vessels returned to their native countries and, by 1948, the respective percentages of foreign landings by value made at Newlyn and Brixham were 34 and 4. The 1964 figures were 6.5 and 0.3. Although foreign vessels have not been based at these ports for an extended period since shortly after the war, landings have continued, partly because of historical associations, but also because French, Belgian and other continental fishermen frequently operate near British shores, and by landing their fish at a British port they can avoid a long journey back to their own country solely to dispose of fish. The need for shelter from the weather, for repairs and for the use of other facilities also causes foreign fishing vessels to enter British ports. Newlyn and Brixham have relatively large harbours, fish markets and comprehensive facilities for repairs and for obtaining stores, gear, fuel and ice. They have therefore proved more attractive than other southern ports to foreign fishermen and Newlyn has been particularly important because of its nearness to the fishing grounds around western Cornwall, which have been favoured by foreign as well as by British fishermen.

The position of Plymouth, as shown in Table 5, has altered little during the period but, in absolute terms, the landings now have a much lower value than they had shortly after the war despite recent increasing catches. Like Newlyn and Brixham, it has depended for its post-war prosperity as a fishing port principally upon demersal fish. In the past, it is true, there was an important winter fishery for pilchards, principally prosecuted by Cornish

vessels, which landed fish at the port, but since the early 1950's this has been of only negligible importance.

As Plymouth provides a large and ready market for fresh fish, the decline of the demersal fishery is at first sight surprising but one does not have to look far to find answers. Alternative employment, often more remunerative and usually providing more consistent work with regular hours, is available nearby. Recruitment for the fishing industry therefore is often difficult. A further point is that, until the early 1960's, the local fishing grounds were becoming less productive and the better areas were a long way to the west. Many of the vessels operating from the port after the war were large, old and uneconomic and, once withdrawn from service, and in one case sunk,¹ they were never replaced.

In recent years, the shellfishing industry at Plymouth has been of greater importance than previously. Crabs mainly have been landed, although lobsters have also been important. The value of the landings between 1954 and 1957 rose from less than £4,000 per year to £10,000 per year. Subsequently, they have usually remained approximately at the level of £10,000-£15,000 per annum, although in 1963 and 1965 they were £6,000 and £7,000, respectively.

Of the remaining principal ports, none has steadily grown in importance throughout the period but there have been times when the value of landings at some centres increased for a few years. This occurred immediately after the war but the improvement was generally more apparent than real, for it was largely a reflection of

rising fish prices during a time of inflation and only at Whitstable was there a significant development between 1945 and 1951. During the war the oyster fishery there had been allowed to run down and the industry suffered a further setback when, following the initial post-war planting of young oysters, there were considerable losses in the severe winter of 1946/1947. By 1951, however, the benefits of the subsequent and more successful layings were being felt.

An almost universal decline soon set in and, although its effect was felt earlier at some centres than at others, its causes were, in general terms almost everywhere the same:

- (a) Reduced fish on the grounds, which in turn may have been due to the effects of overfishing, natural predators or physical factors.
- (b) High and increasing costs of operating, of repairs and of vessels and equipment.
- (c) The relative attractions of regular employment ashore and fishing (as an occupation), which in the late 1940's and 1950's were encouraging men to leave fishing and proving a disincentive to recruitment to the work.
- (d) An uncertain market and low prices for some species (e.g. pilchards).

At Padstow the deteriorating state of the harbour could also be held partly to blame but, if fishing nearby had continued to be good, the necessary maintenance would probably have been carried out. Landings at the port had been made principally by vessels visiting each year from

other parts of the country; shortly after the war the pre-war tradition was restarted, but the harbour, which was subject to silting, was becoming less attractive as an anchorage and the size of the catches was not large enough to make the trip economically worthwhile. After reaching a post-war peak in 1949, the landings were reduced and, by 1952, the only fishing from the port was practised by local vessels.

The effects of the hard winters on the oyster stocks, the high cost of importing oysters for breeding and for laying as young stock and a reduction in public demand for the fish, have all contributed to the deteriorating state of the Whitstable oyster fishery companies and, consequently, to the diminished prosperity of the port; the most recent cold winter of 1962/1963 had the effect of reducing the value of the total landings from £41,000 in 1962 to £19,000 in 1963 despite an increase in landings of sprats there. The quantity of oysters harvested has since continued at a low level but fluctuations in the catches of sprats were largely responsible for the increase in the value of all fish brought ashore to £32,000 in 1964 and the reduction in the following year to £22,000. The sprat fishery had developed during the early 1950's, declined towards the end of the decade as the fish moved from the estuary, but temporarily revived with their return in 1961.

The brief recovery at St. Ives in the early 1960's was largely as a result of an increase in the landings of lobsters and crawfish, in addition to the normal catches of wet fish. In 1960 one vessel was engaged in the

fishery but, by 1963, the number had risen to 16 and vessels from Porthleven, Newlyn, Mousehole and Mullion had converged there.² By 1965, the total landings of shellfish at the port were valued at only £98 and many of the vessels were now harbouring at nearby Hayle, which offered better shelter, lower landing dues and less congestion on land, so that the buyer's lorries did not have to negotiate narrow roads often packed with holidaymakers and their cars.

Landings at Ramsgate were reduced shortly after the war, and one of the principal contributory factors has already been mentioned in connection with the Plymouth fishing industry, namely, that the larger vessels at the port were old and uneconomic in operation but, because of high costs, could not be replaced with trawlers of equivalent catching power. It should be remembered that the port is not well placed for fishing either in the North Sea or in the English Channel, but perhaps the most important reason of all has been the problem common to many ports, the difficulty of obtaining suitable crews.³

The greatest decline in the early years after the war occurred at Rye, where the annual value of landings fell from about £72,000 in 1945 to about £30,000 in 1946 and to approximately £10,000 in 1947. During the war many vessels from other parts of the country were fishing from Rye and landings reached their peak in 1945, when 30 to 40 vessels were operating from the port.⁴ By 1947 the home grounds of many of the vessels had been reopened for fishing and only eight boats were then operating.⁴ In recent years, the industry has revived, and the value of landings

increased from £8,000 in 1960 to £18,000 in 1962 and has subsequently been at the level of £16,000-£17,000 per annum.

Other increases in landings at the principal ports during the last few years have occurred at Folkestone, Hastings and Newhaven. At all three the fleets have been modernised and a number of local individuals, who had not previously fished on their own account but who had in the main been crew members of existing boats and witnessed the prosperity of the local fishing fleet, have with the aid of grants and loans purchased new or secondhand vessels. At Hastings the overall number of vessels was reduced between 1961 and 1964 but at the other two it increased over the same period.

Newquay appeared in the Table for the first time in 1965; here, as at several other centres on the north coast of Cornwall, there has been marked expansion of the shell fishery in recent years.

At Dartmouth (and Kingswear) almost the entire catch is composed of crabs; the Dart provides excellent sheltering facilities and is near good crab grounds. Nevertheless, it was of small significance as a fishing centre until the early 1950's, when the Paignton crab processing firm of Browse Bros. Ltd. opened and boats belonging to this organisation worked mainly from the inlet. During the last few years the company has curtailed its fishing activities but other craft have maintained landings at a moderately high level.

It has been seen that landings at most ports declined after the war. At some this reduction started almost immediately, while at others a period of five or six years elapsed before landings decreased significantly. Where catches have subsequently increased, the change has sometimes been a result of a greater number of vessels fishing from the port or of vessels carrying out successful exploration of new grounds but, in some instances, landings by individual vessels fishing the same grounds have shown an increase.

2. Layout of Ports and Facilities Provided

A large number of fishing centres in the region have no harbour and the fishing vessels are hauled upon the beach for shelter. Most of these places have no great significance but an exception is seen at Hastings (Fig. 7 and Plate 1), where a well organised fishing community has kept the industry alive. At the village of Beesands in Devon the crab fishery has been of considerable importance by south coast standards but, as there has been a growing tendency to use larger vessels for shellfishing, Dartmouth and Kingswear, with their harbouring facilities, have grown while Beesands has declined.

Examples are also seen of ports which have excellent harbours but only a small fishing industry; Portsmouth, Southampton and Falmouth are in this category. Portsmouth and Southampton can provide regular, relatively well-paid employment in other industries and there is little incentive provided for the growth of a large-scale fishing industry, particularly as there are no known prolific



Plate 1 Trawlers on Hastings beach. The "lute" shaped stern of the vessels facilitates launching and landing.

fishing grounds nearby. Falmouth is principally concerned with trading and has, in recent times, always been overshadowed by Newlyn as a fishing port.*

The alterations made at the various ports will be considered under the following headings:-

- (a) Depth, width and sheltering capacity of the harbours.
- (b) Other facilities provided at ports.
- (c) Charges made.
- (d) Ownership.

Ports where only small landings have been made throughout the period are omitted from the survey, even though their harbours may have appreciable importance in other spheres.

Much of the information given is as a result of the analysis of the replies to 21 questionnaires which were completed by Harbour Masters, Borough Surveyors, Borough Engineers and other persons holding relevant positions at ports in the region.

* Early in 1947 a tentative suggestion was made by the Labour Party Fishing Group that there should be sixteen (more might be added) Government-managed deep-sea and herring ports for the country. Falmouth was named for the south-west and was the only one chosen between Great Yarmouth and Swansea. Although the scheme was never put into operation, considerable indignation was aroused among the fishermen of Newlyn; it was stated that Falmouth had no fish docks and little fish was landed there, whereas Newlyn had a fishing history dating back to 1435. (Fishing News No. 1768. 15th January, 1947.)

(a) Depth, Width and Sheltering Capacity of the Harbours

Many of the harbours in the region have been subject to silting to varying degrees but in several instances, because of the small economic importance of the fishing and other maritime activities, little corrective action has been taken. This has meant, in harbours which have little or no depth of water remaining at low tide, that as the harbour bed has been raised, the period of time on either side of an average high tide during which vessels could enter or leave has been gradually reduced. In some cases it has also had the effect of making navigation within the harbour more difficult and of reducing the area available for moorings. Silting has been a contributory factor in the decline of the fishing industry at several ports, among the most notable of which has been Padstow in north Cornwall, where the entire estuary of the River Camel has been affected for many years but only limited dredging has taken place.

Dredging has been carried out in relatively few harbours, either as part of a regular maintenance programme or to remove material which has collected through neglect. At Newlyn it has taken place every three years to retain charted depths and the total cost between 1942 and 1964 has been £81,632 but, at Porthleven, it was only started during the winter of 1963, the first time since 1939; the harbour had changed hands and the maintenance by the new owners was part of a programme to operate the harbour commercially again.

A further example of recent dredging has occurred at Whitstable where, in January 1958, the harbour was sold by

British Railways to the local Urban District Council. Work was carried out in 1958, 1963 and 1964 at a total cost of £5,400.

Few harbours have been deepened, or even had depths maintained where shallowing has occurred, but fewer have been widened, partly because of the lack of necessity and partly because of the cost involved. Probably the only example has been at Whitstable, where widening can be regarded as incidental to other repairs. At the end of 1962 and the beginning of 1963 the wall of the East Quay was reconstructed (see below) following deterioration. As reconstructed, it formed a straight line in plan and so provided a slightly increased area in the harbour.

The structures of many harbours have deteriorated but at some there has been preventive maintenance as well as reconstruction work and there are even instances of additions being made. Most schemes of maintenance and improvement, including those mentioned above, which have involved dredging or widening of a harbour, have not been carried out primarily to help the local fishing industry although it has usually benefited.

It is only at small harbours where major deteriorations to quays and harbour walls have been allowed to go unchecked for long but, as maintenance is sometimes quite expensive, (at Newlyn, for example, the cost since 1942 has been approximately £6,000 per annum) it can be appreciated why harbours with little income apart from that obtained from sheltering small vessels can easily be allowed to fall into a state of decay.

Little apart from routine maintenance has been carried out at most ports, although examples where repairs have been required on a larger scale are seen at Brixham, Ilfracombe, Rye and Whitstable. At Brixham work on the Breakwater Toe (Fig. 3) in 1956-1957 cost £2,200, and miscellaneous repairs in 1963 cost £5,100; the total expenditure was covered out of a Reserve Fund. £10,000 was spent on repairs to the Cove Wall on the south side of Ilfracombe harbour; a Government loan was obtained for this work which was started in 1956 and took nine months to complete. Work was carried out more recently at Rye where, over a ten-month period in 1961-1962, £13,000 was spent on repairs to the Training Wall inside the river mouth; the work was paid for partly by a Government loan and partly by normal River Board funds. Since 1958, when the local council purchased Whitstable harbour, reconstruction work has been carried out to most quays. The wall of the East Quay (Fig. 4) had previously been formed in timber which was rotting away and the quay was being undermined; the wall of the South Quay was made of a combination of timber and steel sheet piles, part of which had been reconstructed by British Railways in 1953⁵ and 1957. Reconstruction of the central part of the East Quay with sheet steel piles took place late in 1958 and early in 1959, of the southern part late in 1962 and early in 1963, and of the western part of the South Quay in the summer and autumn of 1964. To pay for the work a loan was obtained from the Public Works Loan Board; the cost of the reconstruction, including the provision of bollards, decking, fendering, etc., was £115 per foot. The quays to

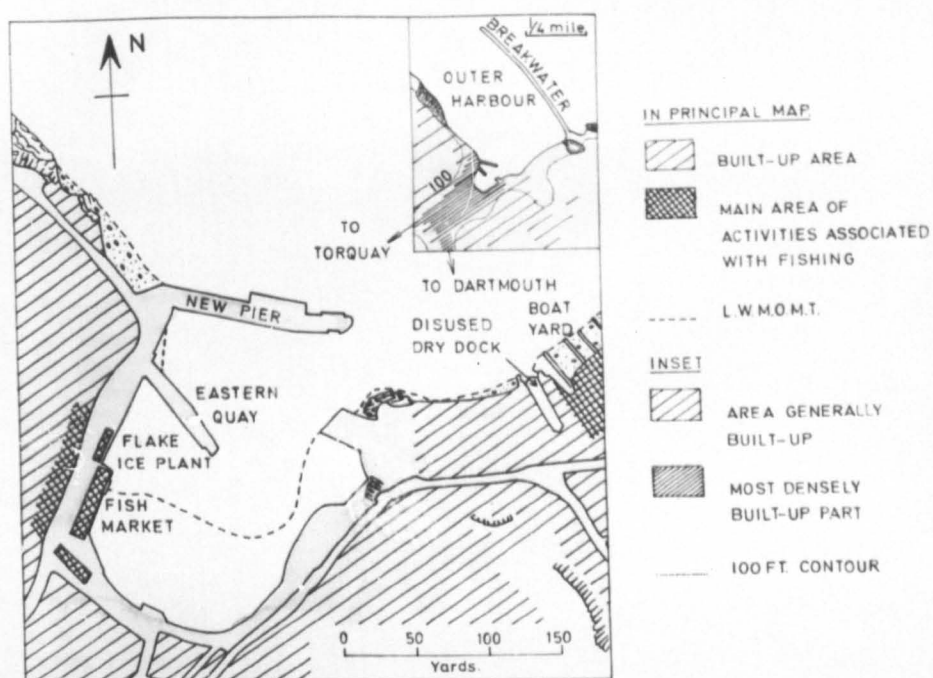


FIG 3 Brixham Harbour

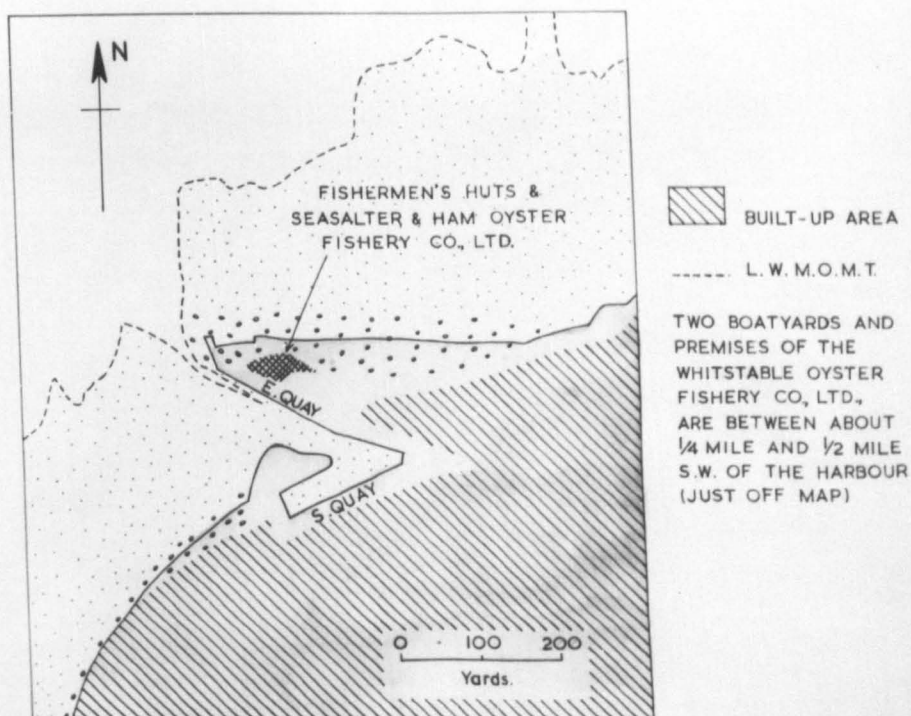


FIG 4. Whitstable Harbour.

the west and north of these basins had been constructed of bricks and masonry and continue in a good state of repair.

Few major extensions have been made to the harbour walls at fishing ports largely because the cost involved would be considerable and might be difficult to recover. Few authorities have the capital or are prepared to obtain loans to provide additional harbouring facilities in the hope that their usage would increase in the future. In 1958 and 1959 an extension was built half way along New Pier at Brixham at a cost of £12,800. The work was paid for by a loan. Among other recent additions have been a small breakwater at Portloe and the rebuilding of the outer pier mole at Boscastle. The previous one was damaged by a mine during the war and later demolished by heavy seas, leaving the inner breakwater to meet the full force of gales so that it was frequently in need of repair.⁶

At the time of the original damage the harbour was in private ownership and no claim was made to the War Damage Commission. It was taken over by the National Trust and, when the reconstruction was carried out in 1962-1963, the cost of about £10,000⁷ was shared by the owners, the Ministry of Agriculture, Fisheries and Food, the Cornwall Sea Fisheries Committee and various local authorities.⁸

Although the detailed planning stage has never been reached, probably the most far-reaching proposal on harbour construction made during the period concerned the building of a deep-water harbour of refuge in north Cornwall or north Devon. In 1945 Padstow was suggested as a possible site in

conjunction with a proposed canal between Wadebridge in the north and Lostwithiel in the south.⁹ Nothing came of the scheme but in 1961 a proposal was made that Clovelly should be considered in the same connection;¹⁰ the Ministry of Agriculture, Fisheries and Food agreed to contribute £10,000¹¹ but in 1963 it was stated by the Ministry of Transport that no grant could be given for deepening the harbour.¹² Later in the same year a group of fishermen discussed the matter with the Parliamentary Group of the Transport and General Workers' Union.¹³ No action has been taken and the future of the scheme is doubtful. More recently, St. Ives¹⁴ and Padstow¹⁵ have been mentioned in connection with a similar project, but again no positive action has been taken.

(b) Other Facilities provided at Ports

At many of the smallest fishing villages only the most rudimentary facilities have been available for the fishermen, who have been allowed to haul their boats and dry their nets upon the beach and perhaps to have a few small huts nearby. For all other requirements they have been compelled to rely on their own ability to improvise and on the facilities provided at other larger ports. Their fish have often been marketed through a salesman or a buyer from another centre and, in addition to taking the fish, he may have made arrangements for the delivery of stores and equipment. This has been convenient to the fishermen and has ensured that all the fish has been sold but when bought directly from them, as opposed to being taken and sold on their behalf, it has meant that only a restricted market has been available and the price obtained may therefore have suffered.

This practice has been quite common all along the coast and in some ports where catches have declined has taken the place of an organised auction market, as at Looe and St. Ives.

The number and type of other facilities have in most cases varied approximately in direct proportion to the importance of the port and, in the main, have changed little except in detail throughout the period.

Net-drying facilities have been provided at most ports, although often this has meant only that the use of the harbour railings or the beach has been permitted for the purpose. Although this has been adequate at trawler ports, where nets have often been dried on board the vessels, drift fishermen who have had many more nets per boat have required more extensive facilities. At Looe a framework has been provided at the north end of the East Quay, but in recent years it has been used to a decreasing extent following the decline of the pilchard fishery.

Methods of fish handling have changed little since the war. They have been mainly manual and have varied slightly from one port to another. Once unloaded, the fish have usually been taken directly to the local market or processing plant or transported to a van or lorry which would carry them to a market or processing plant away from the landing place. Vessels could rarely unload directly at the fish market even in the largest harbours. At Newlyn (fig. 5 and Plate 2) the biggest vessels could lie alongside the market for about an hour-and-a-half on either side of high tide¹⁶ while, at Brixham, only the small vessels could discharge at the fish market and these only for a short period during each tide.

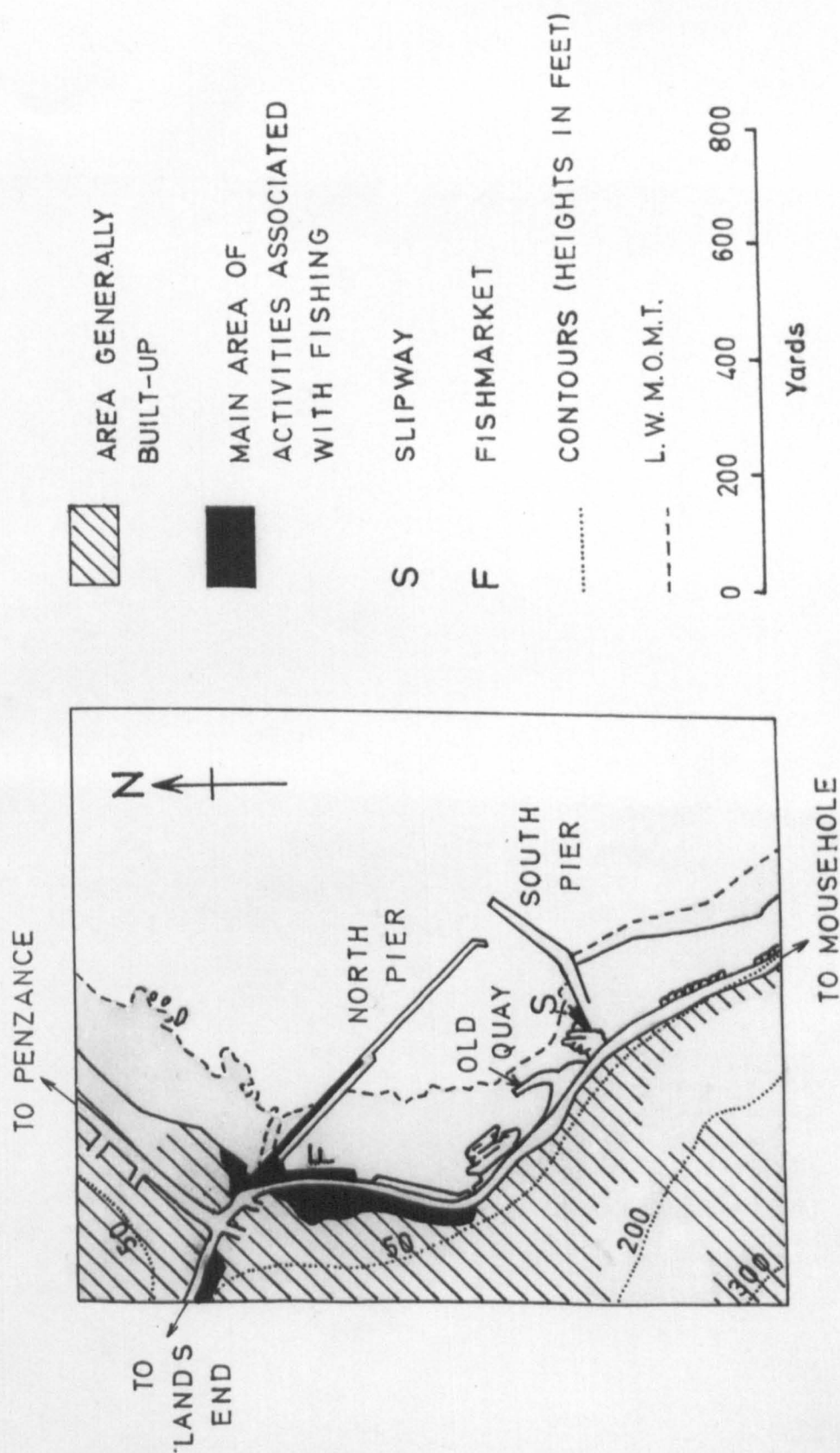


FIG 5 Newlyn Harbour



Plate 2 Newlyn Harbour. A view with 15th Century breakwater in the foreground. The picture was taken when the water level was low and exposed mud is visible at the top of the harbour alongside the fish market.

At many ports trolleys have been used to take fish from the unloading point to the market, processing plant or waiting transport, although at Hastings, Eastbourne, Hythe, Beesands and other centres where there is no harbour, wheeled trucks could not be moved over unconsolidated pebbles, and fish have been carried during this stage of their journey. Where lorries have been employed to remove the fish from the landing place, they have naturally gone as close to the unloading vessels as possible. Where there have been wide quays, as at Newhaven (Fig. 6) and Whitstable they could park at the berthing position but at many small ports in the south west, where space around the harbour has been limited, the fish has been carried or taken by trolley to a convenient parking position.

The storage of fishing gear has presented a major problem for fishermen in the region. Space has been required not only for keeping spare items of gear but also for items temporarily out of use owing to the seasonal nature of much of the fishing; at several Cornish ports, for example, space has been needed for storing drift nets while line fishing has been in progress. A further problem has arisen as many boats in the region have been left on a beach and most of the harbours sheltering the remaining vessels have been dry at low tide; consequently, all these vessels have been easily accessible to pilfering and nearby storage areas have been necessary for attractive items which could not be locked on board.

At approximately half the ports where questionnaires were completed, gear storage facilities have been available in the vicinity of the landing area, just over half provided

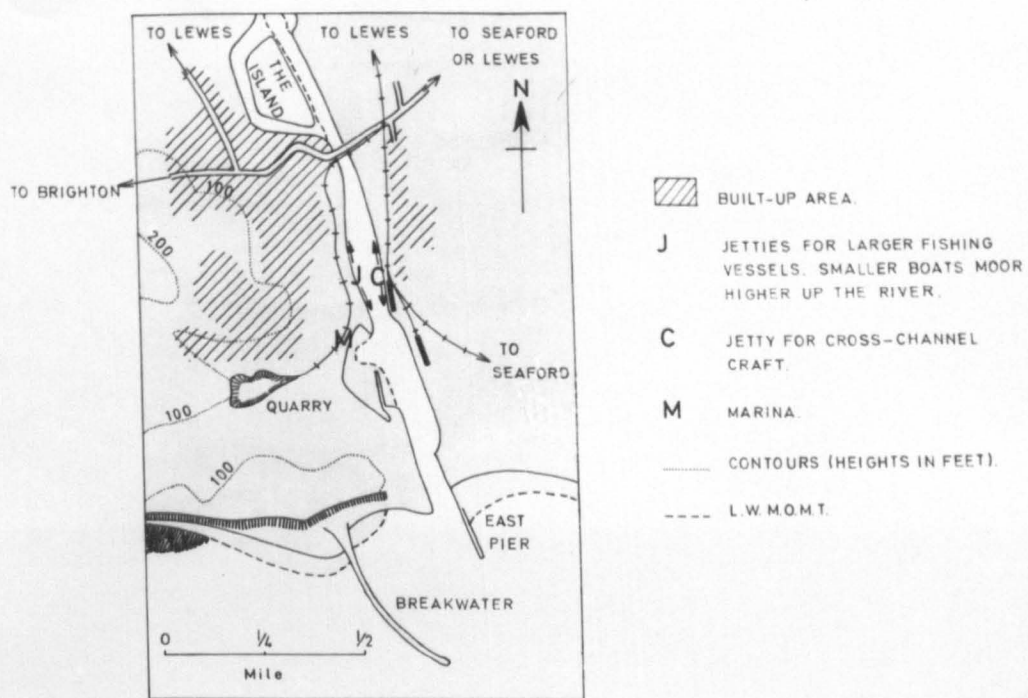


FIG 6 Newhaven

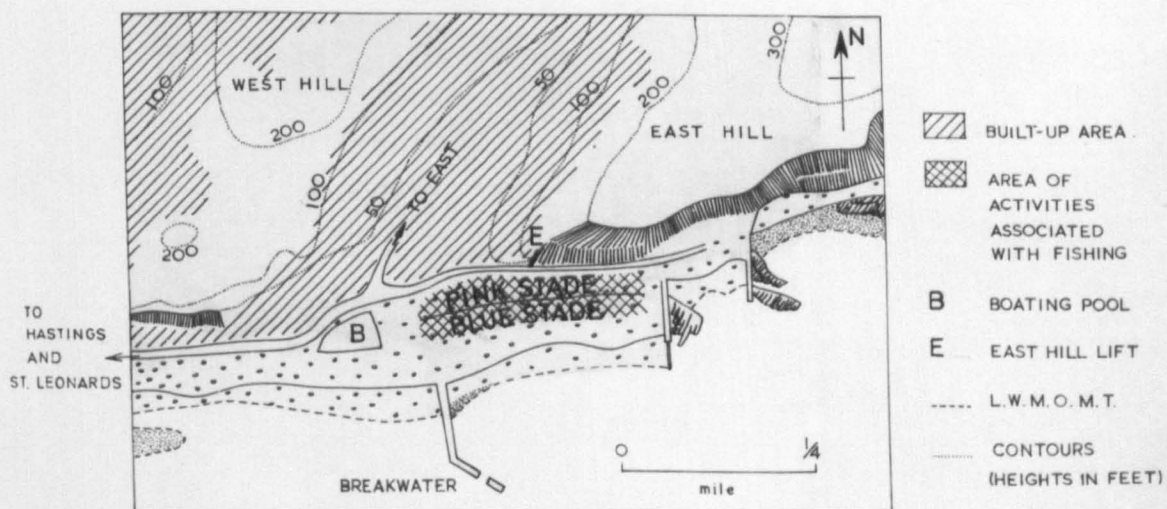


FIG 7 East or Old Hastings.

privately and the remainder by the Harbour Authority, from whom they have been rented. The storage facilities have often taken the form of huts, extreme examples of which are seen at Hastings, where tall, narrow, tarred structures called "rope shops" have dominated the scene for many years; they are situated on the Pink Stade near the East Hill Lift (Fig. 7 and Plate 3). Sometimes space has been provided in other buildings near the harbour; lofts have been used for storing gear at many places, including Looe, Porthleven, Newlyn and Brixham but with the growth of the holiday trade many have been sold for conversion to tearooms and shops. At Hastings lockers have been made available in the new fish market for clothing and smaller items. Shellfish pots which make an uneconomic use of storage space have often been stored in piles on the beach or quayside (Plates 4 and 5).

Ships' chandlers' facilities have been available at a considerable number of ports. Sometimes they have been catering primarily for yachtsmen or amateur boating enthusiasts, particularly at the marinas recently built at Torquay, Newhaven and Dartmouth, but nevertheless have been used by fishermen. The recent provision of fuelling facilities at the pleasure boating areas in Newhaven Harbour and Langstone Harbour, Portsmouth has also helped the fishermen. At a number of ports gear and equipment have been obtained through co-operative trading associations, thereby giving the fishermen the advantages of bulk purchasing. The trading societies in the region with the largest sales in 1964 were those at St. Ives, Brixham, Hastings, Port Isaac and Dungeness.¹⁷ The Society at Folkestone had been



Plate 3 "Rope-shops" at Hastings.



Plate 4 Traditional willow lobster pots on the quay at Mousehole.

prominent until 1958 but ceased to operate in 1959.

The Brixham society, Brixham Fishermen Ltd., did not come into being until 1957, when it was formed primarily with the aim of inaugurating a co-operative marketing scheme.¹⁸ Most fish landed at the port was bought by one firm and some fishermen were sufficiently dissatisfied to make their own arrangements for sending fish to Billingsgate, Plymouth and other markets. Difficulties were soon encountered, and the venture was discontinued,¹⁸ but the society flourished as a gear-selling organisation. In March 1965 Torbay Trawlers Ltd., the main trawling and fish selling concern, was bought by the fishermen and Brixham and Torbay Fish Co., Ltd. was formed as a marketing co-operative. Its existence has provided new incentive for the fishermen and contributed in large measure to the present flourishing state of the fishing industry at the port.

Co-operatives have also recently been started at Rye (in 1961),¹⁹ at Newhaven (in 1966) and at Mevagissey (in 1966) in order to improve local marketing arrangements (Chapter 9).

Although many "small boat" fishermen have made their own nets and considerably more have carried out repairs, there have been few large-scale net-making concerns operating at ports in the area. The integrated enterprise of W. Stevenson & Sons, Ltd. makes nets for its own use, but the solely commercial undertakings are at Porthleven and Bridport. The latter town houses the principal works of one of the largest net making concerns in the country; the origin of the industry here is uncertain, but rope

manufacture, formerly from local hemp and flax, is at least seven centuries old.²⁰ Throughout the period many of the nets used by any but the smallest vessels have been purchased from Grimsby, Bridport and other net making centres. As fishing has declined, particularly at the smaller ports, where greater reliance has been placed on local net-making in the past, so has this "cottage" industry.

In a region where a 50 foot vessel may generally be regarded as large, it is not surprising to find the fishing vessel builders concentrating on smaller boats. The larger vessels have often been bought at least at second hand; most have been of east coast or Scottish origin and several have recently been purchased from Belgium by Brixham owners. Some of the largest craft made in the region for local use have been 70 foot vessels built at Plymouth.^{21 22} Even larger trawlers have been built at Appledore and Portsmouth for Scottish and east coast owners,^{23 24} and facilities for the construction of such vessels also exist at Poole.²⁵

In the past, the building of vessels in the 25 foot to 50 foot range was widespread in the area, but as the fishing industry has declined so has that for building fishing vessels. Where it continues, it does so largely as an ancillary to building boats for pleasure and other purposes. Throughout the period, the main centres of construction of boats in this category have been in the west of the region and particularly at Appledore and Bideford, Portmellon, near Mevagissey, Plymouth and Exmouth. Vessels have also been launched from Teignmouth, Newlyn, Brixham, Padstow and Salcombe and the banks of the River Dart. Porthleven, which was a centre for building many Cornish luggers in the 19th and earlier

20th centuries, suffered a considerable decline but has been given a new lease of life since the depressed vessel building industry was taken over in 1961 by Porthleven Shipyard Ltd., which is part of the Wykeham organisation (Pages 42 and 67). In the east of the region, Rye has been relatively important, and vessels have also been built at Whitstable, Broadstairs and Faversham.

Vessels less than 25 feet in length have been constructed in many areas along the coast, particularly in the Solent area and along the inlets of the south-west, for the building of boats of this size does not require a great outlay in capital or space, unless a considerable number is under construction at one time. Demand for small boats has been increasing, albeit principally for pleasure uses, but it has ensured that the service has continued to be available for the fishermen.

Vessel repairing has usually been ancillary to boat-building and has been carried out at nearly all the ports except those of very small importance. The facilities at the less important ports have usually been limited and even from Hastings, where repairs were performed until the 1940's, vessels now have to be taken to Newhaven for major repairs.

The larger ports have usually had a wider range of repair facilities and these have included engineering shops, slipways, cranes for removing heavy items of equipment from vessels, and repair shops for radio equipment and echo sounders. At Newlyn a slipway was built in 1959 at a cost of £45,000 to accommodate boats up to 110 feet overall length (Plate 6). Prior to its completion, vessels had to be taken to Appledore for major repairs. At Brixham, the largest slipway can take boats up to only 45 feet overall



Plate 5 Lobster pots of wooden laths (at Folkestone). The two basketwork pots are for catching whelks.

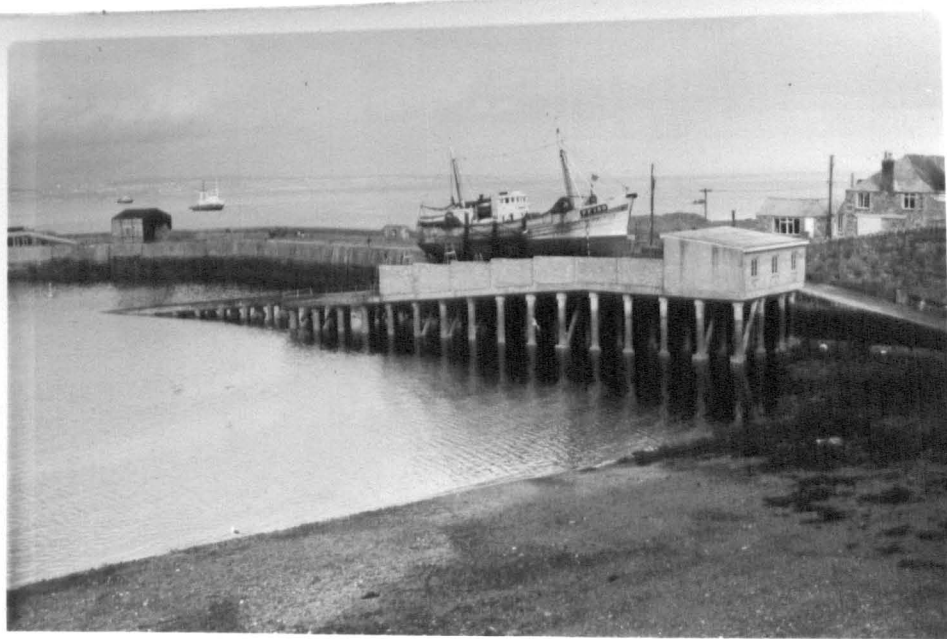


Plate 6 67 ft. trawler on the slipway at Newlyn.

length. A dry dock which used to accommodate the 90 foot trawlers has been allowed to fall into disrepair since 1963 and major work on larger vessels has subsequently been carried out elsewhere.

Wet fish is a commodity which, once caught, deteriorates rapidly unless properly cared for. The provisions of facilities to aid preservation and speedy disposal is therefore of considerable importance. Arrangements for processing and marketing are considered in Chapter 9 and this section will be concerned solely with other aids to preservation, which have usually been in the form of ice, although at some ports cold stores and deep freeze equipment have been available.

At ports where vessels have spent 24 hours or less on each voyage, preservation on board has presented few problems but, once landed, the fish may have been subjected to considerable delay before reaching the consumer, either locally or in another town, and the presence of ice has been of primary importance. At some ports with a relatively large population but where small landings are made, ice has been available although installed primarily to help preserve the greater quantities of fish brought in from the northern ports for distribution locally. Examples have been seen at Weymouth, Portsmouth, Brighton and a recent installation at Poole.

At the more important fishing ports of Newlyn, Brixham and Plymouth ice has been provided throughout the period both to preserve the fish while it has been taken to an inland market and, as the larger vessels from these ports have made voyages lasting up to nine or ten days, during the period

which the fish have spent in these craft after being caught. At centres without ice-making facilities, it is taken by road when required from one of the manufacturers. After the war there was a plant at Padstow which supplied visiting east coast and other trawlers, but the factory closed and ice was obtained for a time from Mevagissey. It was next taken from either Plymouth or Newlyn but this proved to be expensive²⁶ and was probably a contributory factor in the decline of Padstow as a port of shelter for fishing vessels.

At Newhaven and Brixham flake-ice plants have recently been built. This is the first time that ice-making facilities have been provided at Newhaven but when the other installation was constructed for Brixham and Torbay Fish Co., Ltd. in the summer of 1966²⁷ it replaced an ice-making factory which had closed earlier in the year.²⁸ Previously ice has been made in blocks and then crushed for packing around fish in boxes; the older method is still used at Plymouth and Newlyn.

Cold stores have been established at Newlyn, Brixham, Plymouth, Newhaven and some smaller ports. Two of the earliest were brought into operation in 1948 by Suttons (Cornwall), Ltd. of Newlyn and Cornish Products, Ltd., the Looe canning firm.²⁹ The latter plant was intended primarily for pelagic fish and was capable of keeping 3,000 stone of fish and holding those which were caught during weekends.²⁹ In 1952 the firm increased its cold storage capacity and in addition provided 1½ tons of ice per day for the local fleet.³⁰ Other small cold stores have been available in less important ports, of which Hythe and Ilfracombe may be quoted as examples, where the

facilities in the local fishmongers' shops have been used.

Cold stores away from the ports have sometimes been employed, particularly for sprats, when the capacity of the cannery has been fully utilised. The cannery at Fraserburgh, to which many Whitstable sprats have been sent since 1961, has an integrated cold store but local cold stores have often been used, both during the period 1956 to 1961, when there was a cannery in operation at Whitstable, and subsequently, when the Fraserburgh plant has been unable to take more fish.

There are several small deep freezing plants but it is only at Newlyn that significant quantities of fish can be frozen. Suttons (Cornwall), Ltd. has a total capacity of about 180 tons, which is taken up largely by mackerel; other concerns at the port can take about 60 tons of fish.³¹ Suttons were pioneers in this sphere and installed a small pilot deep freezing plant in 1948, at about the same time as their cold store was built. It was not until 1957 that the first of the larger plants was constructed.

Deep freeze plants have also been built in shellfish processing factories at Newton Abbot, Paignton, Porthleven and Newlyn.

(c) Charges made for Harboursing Vessels and Landing Fish

At very nearly all the ports about which questionnaires* were completed, charges have been made for accommodating fishing vessels, either on a beach or at a mooring in a

*The questionnaires were completed in the autumn of 1964. Where more recent figures have been available from other sources, they have been included in the text.

harbour. Of the larger centres, Hastings is the only one at which no charge has been made to local fishermen, except 5s.0d per annum for the rent of "rope shops". Fewer ports have made charges on landings of fish and on only seven of the twenty-one questionnaires was mention made of charges of this type.

It is, perhaps, surprising that during a period when inflation has been fairly general, few ports have increased their harbour and landing dues for fishing vessels. It should be noted, however, that at Newlyn and St. Ives, where the largest proportion of income from fishing vessels has been obtained by a percentage levy on the value of the catch, the rising price of fish has acted as a compensatory factor. Nevertheless, early in 1966 it was recorded³² that St. Ives Harbour Commissioners were intending to increase their harbour charges. At Padstow, where a similar toll has been levied, catches were reduced soon after the war and the total income from the fishing fleets declined considerably; in 1959³³ harbour and landing dues at the port were reduced and have continued at the lower level although from 1st January 1966 a rate has been imposed on all fish brought ashore whereas previously each local vessel had been allowed to land annually fish to the value of £400 before any charge was made.

Harbour dues have increased at Plymouth by 50% since 1945 and at present vary between 11s.10d per annum for small boats and £9.10s. per annum for large trawlers. At Poole the mooring licence fee has recently increased by 10s. to £1. Other increases have occurred at Folkestone, Torquay and Dartmouth, while at Rye a reduction has occurred. Prior to 1951, a charge of 1s.0d per ton per month was

levied, but subsequently this was altered to 10s. per 5 tons per annum and for any vessel over 20 tons 55s. per annum.

The present scales of charges* and the basis for making the charges vary between ports. These will be examined briefly by considering separately the charges made for providing accommodation and for landing fish.

(1) Accommodation Charges

These may be either at a flat rate per annum for all fishing vessels or vary according to the number of entries made to the harbour by the vessel or the size of the vessel, which in turn may be measured by length or tonnage. At five of the twenty-one ports, a flat rate is charged, which varies from £1 per annum at Poole and St. Ives and £1.1s. per annum for the use of the beach at Eastbourne to £2.10s. and £4.13s. at Newquay and Folkestone respectively.

Charges which vary according to the size of the vessel are more common and among the smallest charges made are those at Porthleven (4s. to 12s.6d per annum plus 5s. per annum for the upkeep of harbour lights), Brixham (3d per ton per entry, subject to a maximum of 1s. per ton per year) and Padstow (8d per net registered ton per entry). Variable charges with less fine subdivisions are made at Rye (see above), Whitstable (vessels of less than 5 tons, 4s. per month and those of more than 5 tons, 12s. per month) and Dartmouth (vessels of length 20 feet to 30 feet, £1.10s. per annum,

*See footnote * on page 61.

those of length 30 feet to 50 feet, £3 per annum).* Among the highest charges are those made at Plymouth for large trawlers (see above), Torquay (£7.4s. to £12.12s., depending upon net registered tonnage) and Newhaven (10s. per foot per annum).

While at many ports harbour dues can be paid on a "per entry" basis, this is mainly to cater for visiting vessels and local fishermen usually pay more economical compounded dues. At Weymouth such concessions are not available and a charge of 3s. per entry is made, thereby making the port, from the standpoint of the regular fishermen, one of the most expensive for accommodation charges in the region.

(ii) Charges made for Landing Fish

Two forms of these charges are used. In the first, a charge is made on the weight of fish landed and in the second a percentage levy is made on the value of fish sold. The first is recorded as being in use at three of the twenty-one ports and appears to have little to commend it to the harbour operators except that the charge can be levied before the fish is sold. During periods of rising prices the levy per ton should be increased if the harbour authority is to be compensated to some extent for increased costs; there is no evidence from the questionnaires that this has been done. It is doubtful whether it is realised how small a percentage of the current value of the fish is paid by the fishermen at the ports where this system is in operation. At Ramsgate, Newhaven and Dartmouth the levies are 2s.8d, 6s.3d, and 3s.4d per ton respectively;

*There are other categories but these are the principal ones for fishing vessels.

these figures represent 1/3%, 1/6% and 1/9% respectively of the value of fish sold at the ports during 1963.* As the total amounts raised by the levies were approximately £3, £65 and £37 respectively, they probably did not cover the cost of collection.*

Where percentage levies have been mentioned, they have been 1½% or 2½% (i.e. 3d or 6d per £1). Of the four ports where they are stated as having been in operation, Torquay and St. Ives have used the higher figure; the other two are Newlyn and Padstow, but at the latter port the 1½%** was, until 31st December 1965, modified for local vessels. (Page 62) These levies have obviously been more profitable to the harbour authorities, even when the relative prosperity of Newlyn and St. Ives is taken into account, and in 1963 yielded £158 at Torquay, £1,184 at St. Ives and £3,304 at Newlyn.* No figure has been given for Padstow as the landings were insignificant.

The charges made have changed little since the end of the war. They are many and varied, often bearing little relation to the facilities offered, and sometimes having the appearance of obsolescence. While at first sight standardisation of charges between ports might appear advantageous, it must be remembered that a scale of charges suitable for a port concerned primarily with yachting may not fit in well where fishing is the main interest and, while a higher percentage levy on the value of landings may be justified at some ports, it could prove crippling to fishermen at others.

* Based on the value of fish at these ports in 1963, as calculated from the Sea Fisheries Statistical Tables.

** Prior to 1st August 1959, the figure for Padstow was 8½d per £1. (Fishing News No. 2411. 21st August, 1959.)

(d) Harbour Authorities

Port and harbour authorities may be grouped into two categories, official bodies and private companies. The official bodies have usually been the local councils, who may have appointed Harbour Commissions or similar organisations to administer the harbours on their behalf. British Rail (formerly the railway companies) have had the responsibility for administering some harbours where they have had a special interest.

Where vessels have been accommodated on a beach, the administration has usually been carried out directly by the local councils, to whom any dues have been paid. An exception is seen at Hythe, where the vessels have been beached on land owned by the South-Eastern Gas Board and an annual rent has been paid to the Board for the space occupied by each boat. Prior to the nationalisation of the industry the land was owned by the Folkestone Gas Company.

The changes since 1945 in the authorities administering a sample of seventeen of the harbours in the region are shown in Table 6.

TABLE 6

Changes in the Administration of Selected Harbours in Southern England

<u>1945</u>		<u>1964</u>	
<u>Administering Bodies</u>	<u>Number of Harbours</u>	<u>Administering Bodies</u>	<u>Number of Harbours</u>
Councils	6	Councils	7
Harbour Commissions	4	Harbour Commissions	5
Railway Companies	4	British Rail	2
Other Private Companies	2	Private Companies	2
Catchment Boards	1	River Boards	1
	<hr/>		<hr/>
Total	17	Total	17
	<hr/>		<hr/>

More than half the harbours have been administered by official bodies, but in fewer than half of these have Harbour Commissions been appointed. In 1945 the railway companies controlled four ports, Newhaven, Folkestone, Padstow and Whitstable. As landings of fish and other forms of trade at the latter two ports have declined, the incentive for the Board of British Rail to take an interest in their operation has been reduced. Control of Whitstable harbour was transferred to the local council from 1st January, 1958, while Padstow harbour has been under the jurisdiction of Padstow Harbour Commissioners since 1st January, 1964.

At Plymouth and Porthleven private companies have administered the harbours throughout the period. Since 1961 Porthleven harbour has been leased by W. Wykeham & Co. Ltd. from the previous operators, Porthleven Harbour and Dock Co., and now has the title Port of Porthleven. Sutton harbour, the part of Plymouth used by fishing vessels, has been the responsibility of the Sutton Harbour Improvement Co. since the war.

The remaining change occurred at Rye, where the liabilities of the Rother and Jury's Gut Catchment Board were taken over by the Kent River Board in 1950.

Changes have, of course, occurred at places not covered by the questionnaire. One which is worthy of mention is the change in the ownership of the harbour at Boscastle, which is now owned by the National Trust (page 46) but was previously operated by a private company. The same organisation owns the harbours at Mullion and Pembrok.

3. The Effect of Other Industries

The presence of industries, other than those directly connected with fishing, can have a considerable effect upon a fishing community. It has already been mentioned that harbours kept in a state of repair for other industries have often benefited the fishing industry but the following consequences should also be considered.

- (a) To encourage men to leave fishing to take regular employment ashore, or to discourage younger men from ever seeking employment in the fishing industry.
- (b) To keep the industry alive by enabling men to continue fishing as a part-time occupation when, had the other industry not been present, the poor rewards for full-time fishing would have forced the men to seek other employment, perhaps leaving the area to do so.
- (c) To bring into the region new communities, members of which might gravitate to fishing.
- (d) To provide a larger local market for fish.

It is impossible to judge, without carrying out more detailed study, the degree to which each of these effects has contributed to the changes in the industry. It was felt that an analysis of the National Insurance Cards of persons who are or who have been fishermen might provide an indication of changes of employment. Unfortunately, these statistics are not kept by the Ministry of Labour.

The first effect has almost certainly been an important factor in the decline of several ports, particularly in the south and south-east of England. It is equally important to remember that if other factors, such as obsolescence of vessels, high prices of fishing gear and impoverishment of some fishing grounds, were not responsible for the uneconomic operation of vessels and consequent low earnings, fishermen would be less inclined to seek employment ashore. Although the corollary does not prove the initial premise, it is significant that at Brixham and Torquay, Rye, Newhaven, Teignmouth and Newquay, where fishing has recently been moderately successful, there has been a marked increase in the size of the fishing fleets.

At several ports where alternative employment has been available, some fishermen have taken other work but continued to fish when time has been available. This other employment has been in two forms, either seasonal, thereby allowing fishing to take place during the remainder of the year, or full-time, which permitted the fishermen to operate at weekends, during summer evenings and at holiday times. These double activities have been practised only by the owners and crews of small boats, where few individuals have been involved and arrangements therefore could be flexible. A further requirement is that the overhead costs and the capital invested in vessels and gear have been small enough to justify having the vessel idle periodically, if necessary.

An unfortunate aspect of seasonal employment outside fishing is that by its very nature most of it is available

during the summer, which is also a good period for fishing.* Consequently, many fishermen, particularly those fishing from small boats in the south-west, continue to be unemployed during the winter months. While seasonal employment in other industries was often taken, initially because of the unprofitability of full-time fishing, it may well have been responsible for the total catches at several small ports being reduced to a greater extent than otherwise would have been the case.

At centres where small-boat fishermen have taken permanent employment ashore they have often continued fishing as a profitable spare-time activity. In some places the number of fishermen operating part-time has increased since the war and the increase has been greater than the number of persons leaving full-time fishing at the respective ports. This is an indication of the attraction provided by part-time professional fishing. Throughout the post-war period virtually the entire Portsmouth fishing fleet and, more recently, the growing number of small vessels at Poole and Newhaven (Table 20), have been operated largely in this way.

The problem of attempting to assess the importance of each effect is particularly acute in the third case. While few persons, or relatives of persons, who have been brought into the region by other industries appear to have entered the fishing industry up to the present, any infusion of fresh ideas can do little but good to an industry which has too great a tendency to continue with the methods of the past.

* There is a record of pilchard fishermen assisting in a Cornish cannery during a period of heavy catches in April 1951. (Fishing News No. 1994. 7th July, 1951.)

There can be little doubt that a population which has been increased by bringing new industries into the region will provide a larger market for fish. In the south and south-east where the large and growing population is served by a relatively small fishing fleet, the fishermen have usually been unable to satisfy local demand except in certain special cases, of which the following may be quoted as examples: oysters from Whitstable, sprats landed at several centres, and plaice and other fish caught at Dungeness, Rye* and Hastings.** Consequently, the changing requirements of the increasing industrial population are satisfied largely by varying the quantity of fish, such as cod and coalfish, that is imported into the region.

In the south-west, Newlyn and Brixham are the ports principally concerned with exporting fish from the region. In the vicinity of both ports numbers of employees have been growing (Table 7) so, presumably, there must have been some increase in the quantity of local fish retained even though by far the major part continues to be sent away.

Finally, it should be mentioned that the growth of the holiday industry has meant that a large proportion of the shellfish and some of the wet fish landed at smaller ports, particularly in Devon and Cornwall, are sold locally during the summer months for a higher price than that obtained through wholesale channels.

* Although Rye itself has a population too small to consume much local-caught fish, more could be sold at Hastings, Folkestone or Brighton, but the fishermen prefer to make their own arrangements for disposing of their fish at Billingsgate (page 321), where a higher price can be obtained.

** Hastings fish have usually been sold locally, but some have been sent out of the town, principally during the winter, when local demand is at a minimum. (Page 321)

TABLE 7

Estimated Numbers of Male Employees
in the Areas of the Employment
Exchanges listed at June

	<u>1953</u>	<u>1962</u>
Brixham	1,520	1,608
Newlyn, St. Ives and St. Mary's	7,971	8,581

Source: Ministry of Labour Employment Record.

1. Fishing News No. 2041. 31st May, 1952.
2. Fishing News No. 2582. 30th November, 1962.
3. Answer to questionnaire. Harbour Master, Ramsgate to T.D. Kennea.
4. Fishing News No. 1791. 9th August, 1947.
5. Fishing News No. 2108. 12th September, 1953.
6. Fishing News No. 2505. 9th June, 1961.
7. Fishing News No. 2579. 9th November, 1962.
8. Fishing News No. 2505. 9th June, 1961.
9. Fishing News No. 1672. 7th April, 1945.
10. Fishing News No. 2494. 24th March, 1961.
11. Fishing News No. 2507. 23rd June, 1961.
12. Fishing News No. 2595. 1st March, 1963.
13. Fishing News No. 2619. 16th August, 1963.
14. Fishing News No. 2646. 21st February, 1964.
15. Fishing News No. 2639. 3rd January, 1964.
16. Fisheries of Devon and Cornwall - R.H.C.F. Frampton - Ministry of Agriculture, Fisheries and Food (unpublished). 1954.
17. Annual Report of the Fisheries Organisation Society, Ltd. for the year ending 31st December, 1964.
18. Annual Report of the Fisheries Organisation Society, Ltd. for the year ended 31st December, 1957.
19. Annual Report of the Fisheries Organisation Society, Ltd. for the year ended 31st December, 1961.

20. Fishing News No. 2096. 20th June, 1953.
 21. Fishing News No. 2264. 7th September, 1956.
 22. Fishing News No. 2349. 25th April, 1948.
 23. Fishing News No. 2466. 9th September, 1960.
 24. Fishing News No. 2422. 6th November, 1959.
 25. Fishing News No. 2474. 4th November, 1960.
 26. Quarterly Report of the Fishery Officer for the Cornwall Sea Fisheries Committee for the period ending 16th February, 1951.
 27. Fishing News No. 2780. 16th September, 1966.
 28. Fishing News No. 2763. 20th May, 1966.
 29. Fishing News No. 1842. 31st July, 1948.
 30. Fishing News No. 2030. 15th March, 1952.
 31. Duplicated handout provided by the Harbour Master, Newlyn.
 32. Fishing News No. 2748. 4th February, 1966.
 33. Fishing News No. 2411. 21st August, 1959.
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CHAPTER 3

PRICES OF FISH

It is essential that variations which have taken place in the price of fish are viewed in more than one context if a comprehensive picture is to be presented. Changes in the total landings and their values at the individual ports condition and reflect the prosperity of the ports and consequently are dealt with more fully elsewhere. At this stage, the primary consideration is the value per unit weight (or number in the case of shellfish) of fish caught and the factors affecting it.

The alterations in the prices of fish as a whole may differ from those in the prices of individual species and there are often differences in the prices realised at different ports for the same species.

As only limited information is available in the Sea Fisheries Statistical Tables concerning the prices of individual species at the various ports, this survey will be principally concerned with a consideration of the changes that have occurred without reference to their geographical distribution.

Greater detail is available in the Tables on the landings at Brixham and Newlyn, and so an attempt will be made to assess the variation in the prices of some species of fish a. between the two ports and b. between the individual ports and the national average price for those species. Reasonable conclusions may then be drawn for other ports.

For the purpose of making the comparisons ratios have been used as they present the information in more easily assimilated form than is done by the use of absolute figures.

TABLE 8

Ratio of Prices at First Sale of some
Species of Wet Fish of British Taking

A. Ratio Newlyn Prices : Brixham Prices

	1950	1954	1958	1962
Gurnard	1.02:1	.78:1**	.91:1**	.92:1
Hake	.91:1	.86:1	1.13:1**	.97:1**
Plaice	.84:1	1.04:1**	.93:1**	.88:1
Skate	.85:1	1.04:1**	1.11:1	1.01:1
Mackerel	.79:1	.83:1	1.27:1**	1.77:1**

B. Ratio Newlyn Prices : National Average Prices

	1950	1954	1958	1962
Gurnard	1.52:1	.88:1**	.92:1	.96:1
*Hake	.97:1	.80:1**	.86:1	.83:1
Plaice	.95:1	.92:1	1.07:1**	1.07:1
*Skate	1.03:1	1.12:1	1.13:1	1.10:1
*Mackerel	1.20:1	1.03:1**	1.12:1	1.19:1

C. Ratio Brixham Prices : National Average Prices

	1950	1954	1958	1962
Gurnard	1.49:1	1.13:1**	1.01:1**	1.04:1
Hake	1.07:1	.94:1**	.76:1**	.85:1**
*Plaice	1.12:1	.89:1**	1.15:1**	1.21:1
*Skate	1.22:1	1.08:1**	1.01:1	1.10:1
Mackerel	1.50:1	1.23:1**	.88:1**	.67:1**

Table 8 (continued)

Notes

1. The fish marked * were those whose landings were greater than £10,000 in each of the years shown in B at Newlyn and in C at Brixham.
2. The ratios marked ** are those which vary by greater than 10% from the previous one.
3. Ratios have been used rather than actual prices to try to show the degree of stability or instability of prices between ports and between one port and the national average. At this stage absolute price changes are not considered.
4. Shellfish have not been included for the unit of measurement for the more important types, crabs, lobsters and crawfish was altered during the period.

Source: Derived from figures contained in Sea Fisheries Statistical Tables.

The following points arise from Table 8:-

- (a) Of the 40 ratios given for Newlyn : national average and Brixham : national average, 25 show prices at the ports above the national average ones. 11 for Newlyn : national average and 14 for Brixham : national average.
- (b) At Brixham prices for gurnard, plaice (except for 1954) and skate are consistently higher than national average prices.
- (c) At Newlyn prices for skate and mackerel are consistently higher than national average prices.
- (d) Sections B and C show no real measure of consistency between tendencies (relative to national values) at Brixham and Newlyn.
- (e) Section A shows Newlyn prices above those of Brixham in 8 instances but below in 12.
- (f) If in Sections B and C changes are considered on the basis of whether they are greater or less than 10% over four-year periods, there are 15 in each category.

In Section B, 4 are greater than 10% and 11 are less than 10% but in Section C 11 are greater than 10% while 4 are less than 10%.

This is an indication of stability (relative to national prices) at Newlyn and instability at Brixham.

- (g) If the species whose annual landings are greater than £10,000 are examined, there are 15 changes, of which 5 are greater than 10%, 10 are less than 10%.

This indicates that with larger catches there is greater price stability in relation to national average prices for the fish.

- (h) Sections B and C of Table 8 show fewer variations of greater than 10% in the period 1954 to 1958 than in 1950 to 1954 and also that there were fewer in 1958 to 1962 than 1954 to 1958. It is therefore indicated that prices at the ports are stabilising in relation to national prices.

TABLE 9

Change in Ratio of the Quantity of some
Species of Wet Fish landed by British Vessels

A. Ratio Newlyn Landings : Brixham Landings

	1950	1954	1958	1962
Gurnard	.31:1	1.2:1	1.2:1	3.7:1
Hake	.37:1	1.9:1	2.1:1	4.6:1
Plaice	.28:1	.25:1	.43:1	.42:1
Skate	1.6:1	2.5:1	3.4:1	4.6:1
Mackerel	25.0:1	21.0:1	10.0:1	8.0:1

B. Ratio Newlyn Landings : National Average Landings

	1950	1954	1958	1962
Gurnard	.015:1	.12:1	.12:1	.24:1
Hake	.0025:1	.010:1	.014:1	.018:1
Plaice	.00087:1	.0014:1	.0012:1	.0013:1
Skate	.062:1	.061:1	.079:1	.086:1
Mackerel	.38:1	.47:1	.39:1	.37:1

C Ratio Brixham Landings : National Average Landings

	1950	1954	1958	1962
Gurnard	.049:1	.094:1	.10:1	.065:1
Hake	.0067:1	.0054:1	.0067:1	.0040:1
Plaice	.0031:1	.0057:1	.0028:1	.0031:1
Skate	.039:1	.025:1	.023:1	.019:1
Mackerel	.015:1	.023:1	.038:1	.047:1

Source: Derived from figures obtained from Sea Fisheries Statistical Tables.

Note: All values are given to two significant figures.

There appears to be little if any mathematical relationship between the corresponding sections of Tables 8 and 9. However, a more general relationship between rises in price ratios and falls in landing ratios may be seen. If successive four-year intervals are considered and if intervals with no change in landing ratios or price ratios are omitted, it is seen that rises or falls in price ratios are coincident with falls or rises respectively in landing ratios; in Section A on 9 occasions out of a possible 15, in Section B on 10 occasions out of a possible 13 and in Section C on 11 occasions out of a possible 15. It therefore seems likely that a relationship exists between increases in landings and decreases in average value of the fish.

In Table 8, Section A, a consistent rise in the ratio of mackerel prices is shown; this is accompanied by a fall in the ratio of mackerel landings which is shown in Table 9, part A. This in turn was caused by an increase in the ratio of Brixham landings of mackerel : national landings of the fish, and, indeed, by an absolute increase in the landings of mackerel at Brixham, which in the years 1950, 1954, 1958 and 1962 were, respectively, 512 cwt, 943 cwt, 1,039 cwt, and 1,524 cwt. Over the same period there was a decrease in the ratio of Brixham mackerel prices: national average mackerel prices which underlines the difficulty experienced by Brixham merchants in disposing of the fish at a time when prices for the same fish at Newlyn, where merchants were used to dealing with larger quantities, were consistently above the national average. The part played by marketing arrangements therefore can sometimes have a

considerable effect in determining the price realised for fish at a port.

It has been indicated that prices at the two principal southern ports tend to be higher than national prices for a particular species. This tendency is also apparent at other fishing ports in the region and is not unexpected, as the quality of fish when landed, and this must be reflected by the price realised, varies approximately in an inverse proportion to the time spent in the hold of a vessel.* In 1965 the average duration of a voyage for a trawler fishing in the English Channel was approximately 1.5 days, whereas trawlers fishing in the North Sea and Barents Sea made voyages of average duration approximately of 4 days and 21 days respectively.

The smallness of the sample prevents any definite conclusions on the relationship between prices at other ports. Further research may well prove valuable in showing that the relative importance in this relationship of such variables as transport facilities, marketing arrangements, length of time that the fish has been out of the water prior to sale, geographical position of the port, demand for the particular species and the method of capture.

Variations in price ratios have been considered without reference to changes in the absolute values. In order to present a complete picture the following will be examined:-

* The large modern 'factory' trawlers provide an exception; fish are processed and deep-frozen soon after capture and are landed in excellent condition sometimes after voyages lasting over two months.

1. Average value of total wet fish caught in the waters off southern England.
2. Average value of principal shellfish caught in the waters off southern England.*
3. Average value of total wet fish landed at certain southern ports.
4. Average value of principal species of wet fish landed at southern ports.
5. Average value of selected species of wet fish landed at Newlyn.

1. Average Value of Total Wet Fish Caught in the Waters off Southern England

Variations in the average value of fish landed have little meaning unless compared with a suitable index. In the following Tables, the Retail Price Index and the Index for the Food Component of the Retail Price Index have been used, because the first provides a picture of the changing value of the individual's purchasing power and the second provides a comparison with the changing value of representative food items. As the prices quoted for fish are those obtained at first sale, comparison with the Wholesale Price Index was considered. Unfortunately, no composite index of wholesale prices has been published since 1955; latterly, indices for individual items have been available but none of these items provides a realistic basis for comparison with wholesale fish prices and it has not been possible to obtain any continuity of basis over the complete period since the war.

* Total shellfish landings cannot be considered as the unit of measurement differs from one type of fish to another in the Sea Fisheries Statistical Tables, e.g. oysters - in 100's, crabs and lobsters in 100's or cwts.

TABLE 10Value of Wet Fish caught in the waters
off southern England by British vessels

<u>Year</u>	<u>Total Value (£000)</u>	<u>Total Weight (000 cwt)</u>	<u>Value (£)/cwt</u>	<u>Index of value of fish</u>	<u>Retail Price Index All items</u>	<u>Food</u>
1947	706	300	2.35	100	100	100
1948	830	312	2.66	113	108	108
1949	839	358	2.34	100	111	114
1950	689	311	2.22	94	114	123
1951	871	337	2.58	110	125	136
1952	878	373	2.36	100	136	158
1953	805	378	2.13	91	140	167
1954	724	278	2.52	107	143	171
1955	784	321	2.44	104	149	183
1956	840	320	2.62	113	157	192
1957	764	252	3.03	129	162	197
1958	788	273	2.88	123	167	201
1959	755	245	3.08	131	168	203
1960	725	225	3.22	137	170	202
1961	739	217	3.41	145	176	205
1962	767	230	3.33	142	183	212
1963	706	209	3.38	144	187	218
1964	800	250	3.20	136	193	224
1965	779	219	3.56	152	202	232

Notes

1. The Retail Price Index is the monthly average for each year, except in 1947 when it is for the 17th June.
2. The Interim Retail Price Index was replaced by the Retail Price Index from January 1956.
3. Changes were made to the basis of the Retail Price Index but later figures were corrected to the 1947 base so that the Indices for "Food" from 1952 and for "All Items" from 1956 are approximations.

Sources: 1. Annual Abstract of Statistics.
2. Sea Fisheries Statistical Tables.

The index of the value of fish rose more slowly and less consistently than either of the other Indices and the situation was particularly bad for about ten years after the war. The following factors may have been partly responsible for this state:-

- (a) Price controls in force prior to 1950 tended to have a depressing effect upon fish prices.
- (b) Total landings, although varying from year to year, were generally increasing until 1953. Demand exceeded supply for only a few species (e.g. hake) during the same period, and so difficulty was often experienced in disposing of some of the fish.
- (c) Table 11 shows that the ratio of landings of demersal fish : pelagic fish decreased until 1952. As, by and large, demersal fish are more valuable than pelagic fish, the effect of such a tendency is to depress overall fish prices. After 1952, the ratio remained low until 1956 and since then has varied considerably but has shown no overall rising or falling tendency.
- (d) The low figure for 1950 was caused partly by the reduction in the ratio demersal fish : pelagic fish (Table 11) and partly by the fall in many fish prices following the abolition of maximum price control on 15th April of that year.¹ This apparent paradox was brought about after prices rose immediately decontrol took effect. The reductions occurred shortly after and were due,

it was felt at the time, to the publicity given to the increases by the B.B.C. and the Press,² which in turn caused a reduction in demand and a slump in the industry.³ An additional factor which was instrumental in curtailing demand was the removal from rationing of some other items of food thereby making them more freely available.⁴ By 1951 fish prices were at a fairly high level.

- (e) The minimum of 1953, which affected the whole of the fishing industry of the country, was evident in various European countries and was said to be worldwide because food supplies generally were good.⁵ * The increased availability of meat and other foods was also a cause of the poor demand for fish in Britain⁶ but other factors may have aggravated the situation. The refusal of the British fishing industry to handle catches from Icelandic vessels following the extension of fishery limits around Iceland in the previous year⁵ did not help to foster good public relations, particularly as the ban occurred at a time when prices were considered to be high. Any public resistance to the purchase of fish probably affected the whole industry and may also have been partly responsible for the relatively low figure of 1952** when the

* This statement by the President of the Danish Ocean Fishery Union was obviously an exaggeration, but it gives a broad indication of the widespread nature of the fall in demand for fish when other forms of food were becoming more generally available.

** The average price per cwt at first sale of all cod landed by British vessels at English and Welsh ports in 1950, 1951, 1952 and 1953 was 35s., 44s.3d, 42s.3d and 41s.6d respectively.

ban also applied for part of the year.

At this time the British fish canning industry was facing considerable competition^{7,8} from imported sild and pilchards and restrictions had been placed by Australia and South Africa upon imports of pilchards.⁹ The net result of these factors was that the canneries took fewer fish and the prices per cwt of sprats and pilchards, both important to the south of England fishery, were over 20% lower in 1953 than in 1952.

TABLE 11

Ratio, by weight, of demersal fish : pelagic fish
landed by British vessels in Southern England

1947	2.50:1	1956	.74:1
1948	1.84:1	1957	1.38:1
1949	1.81:1	1958	1.05:1
1950	1.17:1	1959	1.19:1
1951	1.06:1	1960	1.33:1
1952	.74:1	1961	1.06:1
1953	.84:1	1962	1.05:1
1954	1.08:1	1963	1.07:1
1955	.87:1	1964	.95:1
		1965	1.15:1

Since 1953, wet fish prices have continued to show a less consistent tendency than has been evident with retail prices but there was a fairly well marked inflationary trend until 1961. This may have been caused by undervaluation of fish prices in earlier years, but principally it was due to the reduction in landings which usually prevented output from outstripping demand.* Although it is difficult to prove,

* Gluts of pelagic fish such as sprats, pilchards, mackerel and other low-value species such as whiting have sometimes caused reversals of the process.

a further partial cause may have been an increasing demand for fish at a time when meat prices were rising steeply. The changes in price indices when 1954 is taken as the base year can be seen in Table 12, the figures for which have been derived from Table 10.

The variations in the index from 1961 have been partly a reflection of alterations in the size of catches but changes in their composition have also played a part and between 1963 and 1964, when the index was reduced by about 5%, there was a considerable increase in landings of sprats and whiting.

TABLE 12

Comparison of Indices of the value of wet fish
landed in Southern England and of Retail
Prices since 1954

	<u>Index of the</u> <u>value of wet</u> <u>fish</u>	<u>Retail Price Index</u>	
		<u>All Items</u>	<u>Food</u>
1954	100	100	100
1955	97	104	107
1956	105	110	112
1957	121	113	115
1958	115	117	117
1959	122	117	119
1960	128	119	118
1961	136	123	120
1962	133	128	124
1963	135	131	127
1964	127	135	130
1965	142	142	136

Finally, in order to view the southern wet fish landings in perspective, Table 13 shows the value of landings of all wet fish in England and Wales.

TABLE 13Details of Landings of Wet Fish made by
British Vessels at English and Welsh Ports

	<u>Value</u> <u>(£/cwt)</u>	<u>Index</u> <u>(1947=100)</u>	<u>Index</u> <u>(1954=100)</u>
1947	2.24	100	
1948	2.34	105	
1949	2.08	93	
1950	2.09	94	
1951	2.47	110	
1952	2.36	106	
1953	2.30	103	
1954	2.53	113	100
1955	2.58	116	103
1956	2.70	121	107
1957	3.03	135	119
1958	3.21	143	127
1959	3.28	147	130
1960	3.46	155	137
1961	3.58	160	142
1962	3.34	149	132
1963	3.54	158	140
1964	3.83	171	151
1965	3.97	177	157

Source: Derived from Sea Fisheries Statistical Tables.

If columns 1 and 2 of the above Table are compared with columns 3 and 4 of Table 10, it will be seen that the national prices have increased to a greater extent over the 1947 base than have the southern prices. The same state is seen to exist if the 1954 base is considered and column 1 of Table 12 is compared with column 3 of Table 13. The principal reason is that the fish whose prices have remained fairly stable (e.g. sprats and pilchards) have accounted for a considerable proportion of the landings made in Southern England but only a small proportion elsewhere.

2. Average Value of the Principal Shellfish caught in the Waters off Southern England

Owing to the different units of measurement, shellfish must be considered separately from wet fish, as the former are measured by weight or numbers and the latter by weight. Within the shellfish group, different measurements have been used; crabs, lobsters and crawfish were measured by numbers during and prior to 1953 but subsequently by weight. This, in itself, can sometimes have puzzling effects; over the period 1946 to 1953 the average value of each crab unit landed in the south of England was three or four times that of each caught in England and Wales as a whole. After 1953, the difference was reduced to between about 30% and 50%. The reason is that crabs from southern England have been considerably larger and therefore more valuable than the average landed in England and Wales and particularly from the intensively fished waters off the north-east coast. With the alteration in the unit of measurement the differential only reflects the greater value per unit weight of the larger crabs. Oysters have been measured by number throughout the period.

Only crabs, crawfish, lobsters and oysters are considered owing to the small overall significance of other types of shellfish.

TABLE 14Shellfish Prices in Southern England

	<u>Crabs</u>	<u>Crawfish</u>	<u>Lobsters</u>	<u>Oysters</u>
	<u>Value</u>	<u>Value</u>	<u>Value</u>	<u>Value</u>
	<u>/- per 100</u>	<u>/- per 100</u>	<u>/- per 100</u>	<u>/- per 100</u>
	<u>or cwt</u>	<u>or cwt</u>	<u>or cwt</u>	
1946	309	600	423	31.5
1949	284	460	412	39.9
1952	288	792	425	37.2
1955	106	307	420	37.5
1958	102	410	495	41.2
1961	110	410	577	41.5
1964	128	530	690	38.9

Source: Derived from figures obtained from the Statistics Department, Ministry of Agriculture, Fisheries and Food.

Note: Prior to 1954 the figures for crabs, crawfish and lobsters were given per 100, whereas during and after 1954 they were given per cwt.

It is seen from Table 14 that the prices of oysters have shown little significant alteration since the rise shortly after the war but all other shellfish had a higher value in 1964 than in 1955. Price movements prior to 1952 were more erratic and the only significant increase affected crawfish which is not popular in England and is mainly sold abroad. The rise followed the lifting of a ban on the export of these fish to France and other continental countries in 1950.

Lobster prices are shown to have changed little between 1946 and 1952 and the value of crabs was actually lower in the latter year. The reasons for the nature of

these changes are somewhat obscure but several factors are almost certainly involved. It is possible that, despite the effects of maximum price control until its removal in 1947,¹⁰ the immediate post-war value was relatively high and marked increases were therefore delayed. Increasing fishing activity, by continental as well as British vessels, may also indirectly have had its effect for, if this caused a reduction in the average size of crabs and lobsters landed, any inflationary price tendencies would be obscured when, as in Table 14, values were shown on a per unit basis. That such trends were evident, at least for a short period is indicated in a Quarterly Report made in 1947 by the Chief Fishery Officer of the Southern Sea Fisheries District, where it was stated that the revocation of the Shellfish (Maximum Prices) Orders of 1943 and 1944 had helped fishermen considerably as prices were making their "proper market level." It should further be noted in connection with prices of crabs that, although the annual landings of these fish from southern England were reduced from over 700,000 in 1946 to below 600,000 in 1952, the total British landings made in England and Wales increased from 4,600,000 to 7,500,000 over the same period; it is therefore possible that output was exceeding demand in the latter years and, as prices in the south are inevitably affected by national requirements, this was probably partly responsible for the relatively low prices realised.

English and Welsh landings of lobsters displayed a rather different tendency and were reduced from 823,000 fish in 1946 to 726,000 in 1947; 1948 showed an increase

to 898,000 but by 1952 the number had fallen to 672,000. The catch in the south was 309,000 in 1946 but only 201,000 in 1952 (Table 38), and the absence either in this area or on a national scale of any persistently marked increase in price over the 1946 level during this period seems to confirm that immediate post-war values were too high or that the average size of lobsters landed was gradually reduced.

In the period since 1954 during which crabs, lobsters and crawfish have been measured by cwts, prices of both crawfish and lobsters have risen considerably. As crawfish are sold largely to continental buyers the price realised reflects the demand in the country to which the fish are consigned. The size of the present demand may be appreciated when the figures in Table 14 are compared with those in Table 38, and it can be seen that in 1964 the average value of crawfish was about 25% above that of 1961 despite the increase in landings of 300%.

Lobster prices have increased largely as a result of expanding demand when a rising standard of living has brought this popular shellfish within the reach of a widening market. The growth of the export trade in lobsters with France, Switzerland, Belgium and other continental countries (pps 332-6), where high prices are realised, has also played a considerable part.

The effect upon the prices of changes in landings is difficult to assess. Prices of lobsters landed both in the south and in England and Wales as a whole have shown considerable increases since 1955, but while the landings made in the former area are at present well below the level

of those attained during the period 1955-1957 (but above that of 1954) catches made by British vessels in England and Wales are not so markedly different from those of the middle and later 1950's. It is therefore indicated that local changes in landings have not, as yet, been of sufficient magnitude to have any great effect upon prices in the area.

Crab prices in 1964 were also above the level of those of 1955 although the low level of average values in 1958 seems somewhat surprising when compared with the figures for crawfish and lobsters. There appears to be, however, a correlation between landings and values for the quantity of crabs brought ashore rose from 15,100 cwt in 1955 to 17,800 cwt in 1958 and the catch was progressively smaller in each of the years 1961 and 1964 (Chapter 8). The decline from 1958 and the general price tendencies are also evident with landings made in England and Wales.

The value of oysters has been measured in price per 100 throughout the period. This would seem to make the comparison between the prices in different years in the post-war period a relatively simple matter. Such is not the case, however, for oysters from Whitstable have a higher value than those from other areas (Table 15) and many of the overall price variations are simply reflections of the relative proportions of oysters from different parts of the region.

TABLE 15Average value of Oysters (/ - per 100)

	<u>Whitstable</u>	<u>Remainder of South of England</u>	<u>England and Wales</u>
1946	53.0	18.4	34.5
1949	45.6	23.2	37.8
1952	45.0	27.4	36.9
1955	46.6	25.2	37.8
1958	58.8	27.2	38.2
1961	53.0	32.2	39.6
1964	86.2	37.6	47.2

Source: Sea Fisheries Statistical Tables and more detailed information provided by Statistics Department, Ministry of Agriculture, Fisheries and Food.

The reasons for the relatively high value of the Whitstable fish are somewhat difficult to determine and, although no cheaper Portuguese oysters are marketed from there, this is unlikely to account for the main part of the excess which appears to be at least partly due to the relatively large size of the shellfish sold from the town. An additional premium may be paid for the name "Whitstable" but it has been suggested* that the oysters are of better quality than those from other areas. The validity of such a statement is obviously difficult to test.

The prices of oysters from the south of England (outside of Whitstable) have generally exhibited a rising tendency since the war but of the price changes which have affected the Whitstable fish the largest appear to be mainly

* By an employee of the Seasalter & Ham Oyster Fishery Co. Ltd.

a response to alterations in landings. Between 1946 and 1949 the numbers caught increased from 1.6 million to 3.3 million, between 1955 and 1958 they were almost halved from 2.3 million to 1.2 million and from 970,000 in 1961 they were reduced to 51,000 in 1964.

In 1961 the level of values was equal to that of 1946 and at no time were the values much above those of the immediate post-war period until the shortage following the freeze of the winter of 1962-63. It is therefore indicated that after the war Whitstable oysters were over-valued and the absence of any persistent increase in price shows a reluctance on the part of the consumer to pay too high a price for the additional pleasure and, perhaps also, the privilege of consuming Whitstable oysters.

3. Average Value of Total Wet Fish Landed at Certain Southern Ports

In order to compare the changes in wet fish values at certain of the more important southern ports with changes in value within the region as a whole, Table 16 should be studied.

TABLE 16

Details of landings by British Vessels of Wet Fish
at Newlyn, Brixham and Hastings

	<u>Total</u> <u>Value (£)</u>	<u>Total</u> <u>Weight (cwt)</u>	<u>Average Value</u> <u>(£)/cwt</u>	<u>Index</u> <u>1947=100</u>
1947	N. 102,935	54,306	1.90)
	B. 151,622	50,655	2.99) 100
	H. 28,521	6,630	4.30)
1948	N. 153,311	59,876	2.56	135
	B. 167,131	55,849	2.99	100
	H. 33,823	7,145	4.73	110
1949	N. 174,558	75,836	2.30	121
	B. 153,682	52,998	2.90	97
	H. 31,126	6,513	4.78	111
1950	N. 175,137	82,816	2.12	112
	B. 141,297	53,024	2.66	89
	H. 21,403	4,417	4.85	113
1951	N. 258,102	92,322	2.80	147
	B. 160,447	54,065	2.96	99
	H. 25,264	4,108	6.15	143
1952	N. 265,439	103,777	2.56	135
	B. 145,680	63,395	2.30	77
	H. 24,174	4,452	5.42	126
1953	N. 259,646	117,841	2.20	116
	B. 134,761	51,584	2.61	87
	H. 25,790	5,794	4.45	103
1954	N. 240,984	90,600	2.66	140
	B. 132,983	42,422	3.13	105
	H. 21,896	4,507	4.86	113
1955	N. 273,962	95,449	2.87	151
	B. 136,828	51,575	2.65	89
	H. 24,622	4,965	4.96	115
1956	N. 293,174	97,848	3.00	158
	B. 138,619	45,316	3.06	102
	H. 35,029	6,332	5.53	129

continued

Table 16 (continued)

	<u>Total</u> <u>Value (£)</u>	<u>Total</u> <u>Weight (cwt)</u>	<u>Average Value</u> <u>(£)/cwt</u>	<u>Index</u> <u>1947=100</u>
1957	N. 247,308	77,390	3.20	168
	B. 135,326	40,785	3.32	111
	H. 38,288	7,327	5.23	122
1958	N. 272,399	79,873	3.41	179
	B. 135,325	47,830	2.83	95
	H. 37,169	6,969	5.33	124
1959	N. 281,778	88,858	3.17	167
	B. 119,462	37,130	3.22	108
	H. 34,027	5,810	5.86	136
1960	N. 263,224	75,660	3.48	183
	B. 130,785	40,114	3.26	109
	H. 31,513	4,806	6.56	153
1961	N. 254,103	73,748	3.45	182
	B. 132,541	35,770	3.71	124
	H. 40,678	6,632	6.13	143
1962	N. 278,035	75,506	3.68	194
	B. 117,643	40,374	2.91	97
	H. 43,698	7,396	5.91	137
1963	N. 259,644	67,723	3.84	202
	B. 93,703	28,942	3.24	108
	H. 40,430	6,759	5.97	139
1964	N. 282,394	70,814	4.00	210
	B. 98,711	29,641	3.32	111
	H. 43,483	6,736	6.45	150
1965	N. 259,315	58,993	4.41	232
	B. 105,917	26,632	3.97	133
	H. 52,700	8,601	6.12	142

Source: Derived from Sea Fisheries Statistical Tables and for Hastings, for 1965 only, from figures provided by the Statistics Department of the Ministry of Agriculture, Fisheries and Food.

Owing to the large proportion of flat fish in the catch at Hastings, the average value of landings has at all times been much higher than that at Brixham and Newlyn. A similar difference in values is evident when the landings of wet fish made at most ports of Sussex and south Kent are compared with those of Devon and Cornwall.

It is at Hastings where the index of prices has shown the greatest similarity to that for the landings in the area as a whole. This is largely because the composition of the catch has remained relatively stable (although the quantity of fish brought ashore has, of course, varied) but, not surprisingly, there have sometimes been marked variations from the regional figure.

The impressive rises at Newlyn and the generally low value of the Brixham fish have been caused by the composition of the catches. At Newlyn, because of the decreasing importance of line fishing and pilchard drifting and the ascendancy of trawling, the proportion of low value fish in the catches has been falling. In 1950 54% and 34%, by weight and value respectively, of the catch was made up of conger eels, dog fish, gurnards, ling and pilchards, but by 1965 the respective percentages had fallen to 21 and 10. At Brixham the alterations in prices have been largely a reflection, initially, of the decline of demersal fishing and relative rise in sprat fishing and, more recently, the revival of trawling.

4. The Average Value of Principal Species of Wet Fish Landed at Southern Ports

Absolute prices of wet fish have been examined without reference to individual types of fish. Table 17 shows the average price realised for the principal fish landed in the

TABLE 17

Average Price at First Sale of the Principal Wet Fish Caught in Southern England and the Total Landings of Each made by British Vessels at all English and Welsh Ports

	1947			1952			1957			1962			Changes (See Notes 1 and 2)			1952-1957			1957-1962			Changes (See Notes 1 and 2)		
	Value	Weight	per	Value	Weight	per	Value	Weight	per	Value	Weight	per	Changes	Weight	per	Changes	Weight	per	Changes	Weight	per	Changes	Weight	per
	(/-)	(000 cwt)	cwt)	(/-)	(000 cwt)	cwt)	(/-)	(000 cwt)	cwt)	(/-)	(000 cwt)	cwt)	(See Notes 1 and 2)	(000 cwt)	cwt)	(See Notes 1 and 2)	(000 cwt)	cwt)	(See Notes 1 and 2)	(000 cwt)	cwt)	(See Notes 1 and 2)	(000 cwt)	cwt)
Brill	161.7	5		151.3	9		173.3	8		184.2	8													
Conger Eel	31.9	43		33.4	33		34.6	30		46.2	11													
Dab	60.3	93		51.5	52		57.4	34		54.2	16													
Dogfish	23.6	138		34.7	252		40.8	169		49.0	84													
Gurnard	18.3	46		24.9	43		28.8	30		28.4	23													
Hake	61.9	802		138.8	375		189.2	200		195.6	140													
Lemon Sole	96.6	12		129.0	57		161.6	47		166.4	51													
Ling	34.3	147		28.3	113		35.2	102		41.2	57													
Megrim	60.9	31		59.4	39		73.0	25		84.4	13													
Monkfish	47.0	20		46.1	24		47.4	31		81.4	19													
Plaice	27.2	861		110.5	496		126.6	567		132.1	595													
Skate & Ray	38.3	294		65.7	261		72.3	218		84.9	171													
Sole	176.4	86		213.0	63		324.4	49		350.5	47													
Turbot	160.7	86		132.7	39		138.2	41		218.7	32													
Whiting	36.2	268		44.0	246		38.5	186		45.1	170													
All	49.1	11,654		50.3	12,121		63.0	10,613		68.1	10,019													
Demersal																								
Mackerel	26.9	23		44.4	54		58.5	29		63.9	33													
Pilchard	21.3	62		30.8	95		26.1	59		25.6	40													
Sprat	18.2	38		12.7	67		14.8	46		13.2	121													
All	21.4	2,240		23.1	1,569		29.0	819		37.8	466													
Pelagic																								
All Wet Fish	44.7	13,894		47.2	13,690		60.6	11,432		66.7	10,485													

Source: Derived from Sea Fisheries Statistical Tables.

Table 17 (continued)Notes

1. "I" indicates a percentage price increase greater than that for the average fish in the category (pelagic or demersal) during the period shown.
2. "A" indicates total catches which have moved less favourably than those for the average fish in the category (demersal or pelagic) during the period shown.
3. Conclusions drawn below are for total English and Welsh catches, but may reasonably be expected to apply to those of southern England only.
4. The above figures have been derived from the Sea Fisheries Statistical Tables.

region at intervals since the war. Because of the lack of detail given in the Sea Fisheries Statistical Tables, the prices used are those obtained at all English and Welsh ports.

One of the first points emerging is that although there have been considerable changes in the prices of fish, the relative position of individual species of fish in the Tables of Value per Unit Weight has changed little. From consideration of the figures for 1947 and 1962, it is seen that all the six fish of greatest value per unit weight: brill, hake, lemon sole, plaice, sole and turbot and four of the six fish of least value per unit weight: conger eel, gurnard, pilchard and sprat were in the same groups in both years, although their order within the groups has changed.

The high esteem in which many flatfish are held is shown, as only one of the six most valuable fish mentioned above is not in this category. The poor demand for pelagic fish such as pilchards and sprats is reflected in their low value; the catches of these fish are seasonal in nature and unpredictable in volume. Pilchards have not been sold in large quantities on the fresh market, where a higher price might have been obtained, as have their near relations, the herrings; several factors have contributed to this state:-

- (a) Pilchards, being more oily and having smaller roes, have been less popular than herrings.
- (b) The periods of principal catches of both types have often been coincident.
- (c) The pilchard centres of the West Country are more remote from large markets than many of the east coast ports, where herrings have been principally landed. Consequently, there has been no history of pilchards being sold fresh in quantity in large towns for a modern industry to be built upon. This may have been partly responsible for the importance of processing as an outlet for the fish.

The demand for sprats on the fresh market has also declined, unfortunately, as catches have increased, and consequently a large proportion of the sprat catch has been sent in recent years to low-value outlets such as fish meal and petfood manufacture (page 326). The reasons for the unpopularity of fresh sprats as food are a little

difficult to ascertain, but are possibly associated with a reluctance, on the part of the housewife, to prepare and cook a large number of small fish and also, possibly and paradoxically, a scepticism concerning the value of so cheap a food. In the latter part of the catching season the quality of sprats declines and they are then, in any case, less suitable for the fresh outlets because of their poor keeping qualities.

If Table 17 is examined in greater detail, the following points emerge:-

- (a) More "above average" price rises occurred in the period 1947-1952 than in the other five-year periods. This was probably largely due to the removal of maximum price control for most species in 1950.

In order to avoid the effect of price control b, c, d and e are based on the periods 1952 to 1957, 1957 to 1962, 1952 to 1962.

- (b) 21 "above average" price increases occurred. Of these, 19 were accompanied by unfavourable weight of catches movements.
- (c) 33 prices decreased, remained stable, or increased to a smaller extent than the average for the category. Of these, 13 were accompanied by unfavourable weight of catches movements.
- (d) The national landings of demersal fish which were predominant in the southern area have generally decreased to a greater extent than have those of demersal fish as a whole. This is shown by the proliferation of 'A's'.

- (e) Few conclusions can be drawn from the figures for the landings of pelagic fish owing to the overwhelming effect of the decreasing landings of herrings.
- (f) Hake and skate were considerably undervalued under price control in 1947. Hake doubled in value over the period 1947-1952, but part of this increase can be accounted for by the halving of the landings of the fish over the same period.
- (g) Dabs were overvalued under price control. Landings were subsequently reduced but prices have been scarcely affected.
- (h) If the changes in the value/cwt between 1952 and 1962 for the six demersal fish which were dearest and cheapest, respectively, in the earlier year are examined, no significant difference in tendency is evident. The six dearest fish in 1952 were plaice, lemon sole, turbot, hake, brill and sole; of these, three showed by 1962 an above average percentage increase in price. The six cheapest fish in 1952 were gurnard, ling, conger eel, dogfish, whiting and monkfish; four of these showed an above average increase in price by 1962.
- (i) Sprat prices have fluctuated considerably, but have been lower than those for 1947 in all subsequent years shown. Mention has already been made of the difficulties in disposing of sprats and the most likely reasons for the lower prices are as follows:-

- (i) Fewer sprats go to relatively high value outlets (e.g. fresh markets).
- (ii) More sprats go to relatively low value outlets (e.g. processors).
- (iii) Catches sometimes have been in excess of demand.
- (iv) Catching methods have become more efficient and fishermen have been able to accept a lower price without operating at a loss.
- (v) Landings were markedly higher in the 1950's and subsequently than shortly after the war.
- (vi) Under price control, sprats may have been over-valued.

There appears to be a general connection, which has been previously suggested (page 81), between the greatest proportionate increases in price and the greatest decreases in catches for a particular species. This has been by no means common to all fish, however, and disproportionate price moves have often been influenced by other factors, such as the undesirability of a species and/or the saturation of the market. Examples are dabs, whiting, sprats, gurnards and pilchards.

Little connection is evident between proportionate increases in price and the initial value of the fish.

5. Average Value of Selected Species of Wet Fish
Landed at Newlyn

To complete the survey of fish prices a brief examination of the prices obtained at a port in the region for certain species will be made. Newlyn has been chosen, firstly, as a large proportion of the fish caught in the region has been landed there and, secondly, because detailed figures of the landings at the port are available in the Sea Fisheries Statistical Tables.

Table 18 shows the differing changes which occurred to the average prices of the various species of fish, even to those which in 1947 were of approximately the same average value - skate, whiting and mackerel.

TABLE 18Value (£/cwt) at Newlyn of Selected Species

	<u>Hake</u>	<u>Plaice</u>	<u>Skate and Rays</u>	<u>Whiting</u>	<u>Mackerel</u>	<u>Pilchards</u>
1947	3.10	4.86	1.92	1.82	1.85	1.18
1948	4.68	5.20	2.20	2.05	2.99	1.27
1949	4.63	5.41	2.38	1.93	2.03	1.13
1950	5.54	5.16	2.77	2.11	2.42	1.25
1951	5.76	5.81	3.57	3.00	3.32	1.61
1952	5.67	5.90	3.64	2.85	3.19	1.57
1953	6.24	4.77	3.42	2.02	2.30	1.20
1954	6.36	5.11	3.74	2.28	2.31	1.21
1955	6.77	5.00	4.04	2.65	3.14	1.26
1956	7.89	5.68	4.29	2.78	4.72	1.75
1957	8.72	7.10	3.99	2.25	3.50	1.54
1958	8.83	7.01	4.04	2.38	3.55	1.47
1959	8.95	5.81	4.09	2.78	3.12	1.46
1960	8.62	6.39	4.51	3.14	3.38	1.38
1961	9.45	7.76	4.46	3.13	2.95	1.25
1962	7.82	7.05	4.66	2.63	3.78	1.31
1963	8.62	6.56	5.03	2.81	3.39	1.21
1964	10.41	6.88	4.74	2.78	3.08	1.22
1965	11.06	6.55	5.04	2.51	2.95	1.29

Source: Derived from Sea Fisheries Statistical Tables.

Note: The figures for 1947-1949 inclusive are for all wet fish of British taking landed in England and Wales. Owing to the controls in force at the time, they will be little different from prices in southern England but nevertheless have been little used in the text.

It has been shown that national average prices of fish are affected to a considerable extent by changes in landings. The same does not necessarily hold true for local prices and local landings; external influences sometimes have a considerable effect and one of these external influences may be the size of national landings.

This is not surprising, particularly as a high proportion of the Newlyn fish is sent to inland markets. It almost certainly holds true with hake as Newlyn prices for these fish have followed the national tendency to increase steadily while national catches have been reduced, even though there was a period, between 1950 and 1961, when local landings from British and foreign boats remained fairly stable. This possible relationship to national prices is further emphasised by the reduction in value which accompanied the marked fall in landings between 1961 and 1962. Over this period landings in Great Britain increased from 202,000 cwt to 229,000 cwt and average values fell from £9.36 per cwt to £8.18 per cwt.

The other fish considered show a greater but still not outstanding correlation between local changes between successive years in landings and prices. Of the 75 changes occurring within the five species from 1950 to 1965,* 46 rises or falls in landings were accompanied by decreases or increases, respectively, in prices. The effect of other influences is, nevertheless, clearly seen.

While 10 of the 15 tendencies in the changes of pilchard prices between consecutive years have accompanied opposite changes in the tendencies of weight landed, the small overall change in pilchard prices over the period

* See note at foot of Table 18.

1950-1965* has accompanied a considerable fall in pilchard landings. This clearly shows the governing effect of the limited market for these fish upon the prices obtained.

Landings of skate at Newlyn have shown an overall decrease since 1959 but previously had varied considerably without showing any definite tendency. The overall increase in value between 1950 and 1958 appears to be a reflection of the nationwide reduction in landings of the fish rather than of local changes. Since 1959 both local and national landings have decreased.

The rises in price consequent upon the relaxation of controls can be seen in four of the six fish. Pilchards were decontrolled in 1946 and cannot be used as an example, while the price of hake increased only marginally after the removal of price controls in 1950. The rises following decontrol for mackerel in 1947 and for plaice, skate and whiting in 1950 are quite considerable. It can be noted that both mackerel and pilchard prices rose sharply between 1950 and 1951, possibly in sympathy with the general increases prevalent at that time. During 1953 prices of all the fish shown, except hake, were reduced, as were prices on a national level (page₈₆).

A comparison of national prices and the local prices can be made by studying Tables 17 and 18. The 1947 prices in both Tables are national ones and a comparison must be made for the years 1952, 1957 and 1962. The prices obtained for hake are in each of the three years lower than the national ones but, of the other fifteen prices compared, only for mackerel in 1952 is the Newlyn price lower than that nationally obtained.

* See Note at foot of Table 18.

Several factors may be responsible for the relatively low hake prices at Newlyn: local market arrangements probably have not been organised to deal with these fish to the same degree as have those at ports such as Fleetwood, where a much greater quantity of hake has been landed each year. It is also likely that the Newlyn fish are generally smaller and therefore have a lower value per unit weight, than those taken from more distant waters by Fleetwood vessels. Finally, distribution costs for the limited quantities from the south-west may be the greater per unit weight.

Almost the entire pilchard catch is landed in Cornwall and no great significance can be attached to the small difference between the Newlyn and national prices for this fish, but the prices for the remaining fish, other than hake, confirm that the high quality Newlyn-caught fish are valued more highly than fish of the same species landed at some of the northern ports after spending a longer period in the hold of a trawler. The sample taken is small in size but it can be easily shown that the same condition applies to other species of fish.

1. Fishing News No. 1918. 14th January, 1950.
 2. Fishing News No. 1947. 5th August, 1950.
 3. Fishing News No. 1936. 20th May, 1950.
 4. Fishing News No. 1962. 2nd December, 1950.
 5. Fishing News No. 2109. 19th September, 1953.
 6. Fishing News No. 2096. 20th June, 1953.
 7. Fishing News No. 2086. 11th April, 1953.
 8. Fishing News No. 2121. 12th December, 1953.
 9. Fishing News No. 2087. 18th April, 1953.
 10. Fishing News No. 1790. 2nd August, 1947.
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CHAPTER 4

FISHING VESSELS AND GEAR (1)

Fishing methods depend largely upon the type of fish it is hoped to catch, and similar methods are in the main adopted wherever similar species are the object of fisheries. There are a few local variations which continue in use, often because of historical associations or local peculiarities of fishing grounds but sometimes also because the fishermen cannot afford to equip with newer and more effective gear and are forced to retain obsolete methods. This uniformity in types of fishing gear for similar species has been found, with few exceptions, to rule throughout the period of the survey and, although it has not always been so in the past, it is likely to continue in the future, as modern communications, widespread advertising and the unifying influence of bodies such as the Ministry of Agriculture, Fisheries and Food and the White Fish Authority enable information concerning new and improved methods to be transmitted to all interested parties in a relatively short space of time.

During the post-war period, changes taking place have in the main been virtually undetectable by the casual observer; nevertheless the effect of many of the changes has been of fundamental importance, the introduction of electronic aids being a case in point.

As comprehensive descriptions of the different types of fishing gear and vessels used within the region have been given elsewhere,¹ and ² this present investigation

will be concerned with the changes that have occurred, with little reference to many of the details of equipment and operating methods. Nevertheless, some illustrations have been included where it is considered they may prove helpful. The following factors will be considered in this chapter:-

1. Numbers of fishing vessels and their geographical distribution.
2. Ancillary equipment.
3. Materials from which fishing gear has been made.
4. Subsidies payable on vessels and equipment.
5. Legislation governing size of meshes of fishing nets.

In Chapter 5 the relative importance of the different types of gear, fishing methods and vessels will be examined.

Many of the changes have been of a minor nature and, while they have been designed or have evolved to make the fishery more effective or the fishermen's work a little easier, their overall effect has been small and details of them are omitted from this survey, which is primarily concerned with changes having a greater overall effect.

1. Numbers of Fishing Vessels and their Geographical Distribution

Small vessels predominate in the fishing fleets of southern England but information concerning them is less reliable than that for larger vessels. The Sea Fisheries Statistical Tables give information for selected ports only

and details of minor ports and inlets and the small vessels sheltering there are usually incomplete. On occasions, data about some of the more important ports are lacking and, in the years 1959 to 1961, details for the vessels fishing at Newhaven and Folkestone were omitted.

Despite the limitations of the figures available the preponderance of small vessels is clearly seen in Table 19.

TABLE 19

Number of Fishing Vessels at Ports
of Southern England

<u>Year ending</u> <u>31st Dec.</u>	<u>1st Class Vessels (or</u> <u>those over 40 ft. in</u> <u>length) - see Note 3</u>	<u>2nd and 3rd Class</u> <u>Vessels (or those</u> <u>less than 40 ft. in</u> <u>length) - see Note 3</u>
1945	126)
1946	122)
1947	127)
1948	99)
1949	105)
1950	106)
1951	116)
1952	126	487
1953	117	493
1954	116	498
1955	116	497
1956	110	523
1957	113	552
1958	118	543
1959	97	878
1960	100	856
1961	96	871
1962	117	907
1963	128	947
1964	126	908

Figures not
available.

Table 19 (continued)Notes

1. Until and including 1947 the figures for vessels related to the number of vessels registered at the ports. After 1947 the figures related to the number of vessels fishing from the ports, so the two sets are not strictly comparable.
2. Figures up to and including 1952 were supplied by the Registrar-General of Shipping and Seamen. After 1952 they were supplied by the District Fishery Officers of the Ministry of Agriculture, Fisheries and Food (or the Ministry of Agriculture and Fisheries).
3. As from 1st January, 1955 a change of classification occurred. Previously vessels were divided into 1st, 2nd and 3rd Classes, where 1st Class vessels were those of 15 tons gross and upwards. Subsequently the division was taken as 40 ft. Registered Length. This alteration appears to have made little difference to the numbers of vessels in the various categories.

Source: Sea Fisheries Statistical Tables.

The apparent increase in the number of small vessels is partly due to the inclusion of more small ports in the figures in later years (22 in 1962, 1963 and 1964, compared with 16 in 1952) but, owing to the size of the increase (nearly 100%, whereas the increase in the number of ports covered was less than 50%), numbers of vessels have also probably increased absolutely.

Alterations in the overall number of larger vessels (i.e. 1st Class ones or those over 40 ft. in Registered Length) have been fewer and some of the apparently more

significant variations have only reflected the limitations of the statistics. There were the omissions of the period 1959 to 1961 while between 1947 and 1948 and between 1951 and 1952 there were changes in the bases of the statistics. Taking these factors into account, the principal overall changes appear to have been:-

- (a) An increase in the number of 1st Class vessels between 1948 and 1951.
- (b) A decrease between 1952 and 1953, when the net loss of relatively large vessels was 9. One vessel joined the Mevagissey fleet but one ceased to fish from each of the ports of Rochester, Bideford, Newlyn and St. Ives; two vessels left each of the ports of Newhaven, Brixham and Plymouth.
- (c) Between 1953 and 1962, overall numbers of larger vessels were relatively stable; there have been movements between ports and some vessels have stopped fishing while others have joined the fishing fleet. The general effect has been to leave the overall position unchanged.
- (d) The increase in larger vessels between 1962 and 1963 was spread over several ports and reflected the growing prosperity felt in the early 1960's at some centres, particularly Newhaven, Teignmouth, Brixham and Plymouth. Over the same period two additional vessels over 40 ft. in length joined the fleet at Poole and at Dartmouth two vessels of over 40 ft. were recorded

in 1962 and, by 1963, the number was four.

- (e) An increase in the number of smaller vessels since 1955.

An indication of some of the changes in relative importance is given in Table 20. In most cases, where the number of larger vessels fishing from a port is unknown, the number is probably zero. This does not hold for smaller vessels, and usually little or no indication of the importance of a port can be obtained from statistics concerning these latter vessels as most are fishing only occasionally but a few operate on a full-time basis. This occurs at Hastings and Dungeness, where there are no harbours and the vessels used are of a type that can be easily pulled up on the beach.

Most of the changes in the number of larger vessels show a broadly similar trend to the tendency in landings but generally, where there has been a reduction in the number of vessels, it has been smaller, proportionately, than the decline in catches, and there are examples, such as Plymouth and Looe, where the size of the fleet has been fairly stable despite falling catches. This may have been partly due, as at Looe, to an increase in activities other than fishing, usually associated with the holiday industry, which have provided an income to compensate for the loss in earnings from fishing. It is also significant that at some centres, and Plymouth is in this category, the average size of 1st Class vessels and those over 40 ft. in length is smaller now than after the war. Consequently small apparent changes in the number of craft may sometimes disguise considerable reductions in fishing power. One final factor

which may well have had some effect is the natural tendency for fishermen to keep their vessels operating as long as possible, even though catches and profits are being reduced; the various subsidy schemes have provided assistance to this end.

Newlyn and Brixham stand out clearly in the Table as having, throughout the period, the greatest number of major fishing boats. The figures give no indication of the changes in size and type of vessels but at this stage it is sufficient to state that at Newlyn there has been a growing emphasis on craft over 70 ft. in length, while at Brixham the swing of favour has been from this type of boat to those in the 40 ft. - 60 ft. category. The significance of these alterations as well as the more important ones elsewhere will be dealt with in detail in the next chapter.

TABLE 20

Number of Fishing Vessels at Selected Ports 1948-1963

Port	1st Class (or over 40 ft.)						Others			Total		
	1948	1953	1958	1963	1948	1953	1958	1963	1948	1953	1958	1963
Rochester	NK	2	NK	NK	NK	11	NK	NK	NK	13	NK	NK
Whitstable	NK	4	6	5	NK	33	36	29	NK	37	42	34
Margate	NK	1	1	NK	NK	8	6	NK	NK	9	7	NK
Ramsgate	8	4	2	NK	NK	6	7	NK	NK	10	9	NK
Folkestone	10	10	6	7	NK	17	20	10	NK	27	26	17
Dungeness	NK	NK	NK	0	NK	NK	NK	28	NK	NK	NK	28
Rye	NK	1	NK	0	NK	9	NK	18	NK	10	NK	18
Hastings	NK	NK	NK	0	NK	NK	NK	49	NK	NK	NK	49
Newhaven	NK	5	5	9	NK	9	14	29	NK	14	19	38
I. of W.	NK	NK	NK	0	NK	NK	NK	56	NK	NK	NK	56
Portsmouth	NK	NK	NK	0	NK	NK	NK	69	NK	NK	NK	69
Poole	NK	1	3	5	NK	57	64	90	NK	58	67	95
Weymouth	NK	NK	NK	0	NK	NK	NK	72	NK	NK	NK	72
Teignmouth	NK	NK	NK	8	NK	NK	NK	23	NK	NK	NK	31
Torquay	NK	NK	3	8	NK	NK	26	22	NK	NK	29	30
Brixham	30	29	21	26	NK	41	52	41	NK	70	73	67
Dartmouth	NK	NK	NK	4	NK	NK	NK	20	NK	NK	NK	24
Hallsands & Beesands	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK
Plymouth	9	9	10	9	NK	47	42	29	NK	56	52	38
Loe	6	6	5	7	NK	58	46	38	NK	64	51	45
Polperro	NK	NK	1	NK	NK	NK	19	NK	NK	NK	20	NK
Mevagissey	9	8	6	2	NK	90	90	86	NK	98	96	88
Porthleven	NK	1	3	NK	NK	34	25	NK	NK	35	28	NK
Helford	NK	NK	NK	0	NK	NK	NK	28	NK	NK	NK	28
Passage	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK	NK
Newlyn	20	26	32	29	NK	22	32	52	NK	48	64	81
St. Ives	7	7	7	8	NK	43	59	66	NK	50	66	74
Newquay	NK	NK	NK	1	NK	NK	NK	50	NK	NK	NK	51
Port Isaac	NK	NK	NK	0	NK	NK	NK	42	NK	NK	NK	42
Ilfracombe	NK	1	3	NK	NK	8	5	NK	NK	9	8	NK
Bideford	NK	2	4	NK	NK	0	0	NK	NK	2	4	NK
Total (of figures known)	99	117	118	128	NK	493	543	947	NK	610	661	1075

Source: Sea Fisheries Statistical Tables.

2. Ancillary Equipment

Echo-sounding equipment transmits sound waves downwards from a ship; the waves are reflected back from the seabed or other obstacles in their path to a receiver in the vessel and an elevation of the seabed and the other obstacles over which the ship is passing is recorded on a sheet of paper. Although it had previously been employed in larger vessels,* equipment of this kind was not used by Cornish fishing boats³ and probably also not by those from other parts of southern England until after the second world war.

The positions of wreckage and the state and depth of the sea floor are shown and the equipment is therefore extremely useful as an aid to navigation and as an indication to trawler skippers of the type of ground over which they are moving and whether or not it is suitable for trawling. In addition, the position and extent, along the course of the vessel, of shoals of fish are displayed, thereby helping the fishermen to choose, prior to lowering their nets, which areas are likely to prove to be the most fruitful.

Echo sounders have been used to assist the demersal fishermen by showing them which parts of the seabed are most suitable for fishing. If the grounds are very uneven, strewn with wrecks or rocky, they are likely to lose their trawls and will therefore avoid such regions. More recently, echo sounders have been used by the shell fishermen in the

* The first record of an echo meter being used was in 1933 when traces of herrings were taken. Fishing News No. 2326. 15th November, 1957.

south-west to show the positions of rocky areas likely to prove productive. The introduction of cheaper, transistorised equipment has made the fitting economical in smaller boats, and considerable benefits have been derived.

For catching pelagic species, the benefits have also been considerable; the equipment is used to locate shoals of fish and the fishermen either operate in a region where the nets will reach the densest shoals, or adjust the depth at which their nets are fishing in the water.

Some of the first experiments in the use of echo sounders in this way were carried out by the Ministry of Agriculture and Fisheries research vessel, which was fishing experimentally for pilchards in Cornish waters in 1947 and 1948. The local fishermen were swift to appreciate the benefits of these sounders and some would go alongside the research vessel to ask advice concerning the whereabouts of the fish before proceeding to sea.⁴ Prior to the introduction of this equipment, the pilchard fishermen relied to a greater extent on signs such as active sea birds, discoloured water, small bubbles in the water or the vibrations on a piece of weighted wire drawn through the water behind the boat.

The echo sounder was partly influential in causing the widespread changes in the methods of catching sprats that have taken place since 1950. Previously the fish had been caught by methods which relied to a great extent upon luck to obtain large landings. With the new method, the echo sounder helped to locate shoals which were then caught in a trawl; the two devices were complementary in the success

of the fishery. In the region being surveyed, this method of fishing started in the Thames estuary in 1950, was being used off Poole and in Torbay by about 1954 (Chapter 5) and nowadays almost all sprats are caught in this way.

One of the most important navigational instruments that has come into use since the war is the Decca Navigator; with its aid the master of a ship can pinpoint his position with extreme accuracy. The basis of the Decca Navigator is a radio receiver which obtains signals from a group of fixed transmitting stations; the vessel's position relative to these stations is given by readings on three dials and can easily be plotted on a navigation chart which has been overprinted with a special set of co-ordinates. The instrument can be obtained by renting from the manufacturing company; for an additional fee an associated Track Plotter may also be obtained but very few owners in the south have availed themselves of this facility.

Despite their relatively high cost, Decca Navigator instruments have been fitted to most of the larger trawlers in the region and the equipment was still in its infancy when it was recorded in 1956 that it was to be installed in all seven of the vessels operated by Torbay Trawlers Ltd. of Brixham.⁵ It has since come to be regarded almost as a standard item on vessels down to about 40 feet in length.

The advantages of using this aid are numerous. There is, of course, the general navigational help which is provided in foggy conditions, but the ability to establish one's position with considerable accuracy has specialised benefits for fishermen; prolific fishing grounds, once marked, can easily be found in the future and general areas

where the presence of wrecks and rocks on the bottom has caused loss of fishing gear may be partially exploited once clear passages through the obstructions have been accurately plotted.

In recent years sounders have been supplemented by echo ranging fish finders; these can be used to establish the general position of fish before the vessel is directly overhead and with one type of equipment* it is possible to locate a worthwhile shoal at ranges up to 960 yards in any direction from right ahead to 135° port or starboard.⁶ As an additional refinement, either with or without echo ranging equipment, a transducer attached to the headline of the trawl through a recorder in the vessel provides visual information of the depth of the trawl and the fish around its mouth. This is particularly useful with midwater trawling as the net may be raised or lowered in the water to the position where it is shown that the maximum concentration of fish occurs. The system has been employed, sometimes with marked success, in experimental trawling for pilchards⁶ in Cornish waters. Neither echo ranging equipment nor headline transducers have become widespread in the area, however, largely because the cost has been too great to justify installation in small vessels.

There are no other items of ancillary equipment which have had a similar effect upon the fisheries, although the increasing use of radio transmitters and receivers has shown advantages. A foreknowledge of fish to be landed can

* Kelvin Hughes CERES (Combined Echo Ranging Echo Sounding.)

help salesmen in their planning and a skipper who hears by radio that a market is short of fish may curtail his trip in order to get good prices for the fish already caught. Having transmitters and receivers on board can also help to foster co-operation between the crews of different fishing vessels and can be of considerable assistance if a vessel gets into difficulties.

In the last few years more economical radar sets have been on the market. They can provide useful aids to navigation, particularly in bad weather. A set was installed in a 50 ft. Folkestone vessel which was launched late in 1964 and there is another fitted in a Salcombe crabber. Nevertheless it is doubtful if such equipment will come into widespread use in the southern area for some time particularly as so many of the vessels fish near to their home ports in areas which their skippers know well.

3. Materials from which Fishing Gear has been made

An increasing use has been made of plastics in all sections of the fishing industry. This has been mainly evident in the changes in the fibres used for netting, but ropes and fittings for nets and traps have also been made increasingly from synthetic materials. The fibres used are those which, weight for weight, are considerably stronger and have greater abrasion resistance than cotton, sisal, hemp or manila. All the synthetic fittings and fibres employed are subject to little deterioration from exposure to sea water and weather.

One of the earliest records of rot-resistant artificial fibres being used by British vessels is of a successful trial with a nylon trawl early in 1947 by the Hull vessel "Cape Trafalgar".⁷ Experiments were carried out at Grimsby in 1948,⁸ but even by 1952, only 1% of the nets used at Hull were made of nylon, according to an estimate quoted at the time.⁹ It was stated that nylon nets would last four or five times as long as those made of sisal, but they were several times dearer and could be lost just as easily.

Progress towards the general usage of nylon nets was also slow in the southern area and cost was an important deterrent, although the advantages of these instruments were not disputed. In 1955 a Bideford vessel experimented¹⁰ with nylon trawls, initially using a net with only the cod-end made of the fibre but later she fished with a complete nylon trawl. It was found that the new cod end lasted at least four times as long as one of cotton or hemp and, even though the nylon net was larger than the net normally employed, less tractive power was required, presumably principally because, owing to their considerable strength, the threads of the nylon net were much finer than those used in instruments made of natural fibre. One important outcome was a reduction in the fuel consumption and it was claimed that only 12 gallons of fuel were being used for each 17 formerly burnt.¹⁰ While there are undoubtedly advantages in this direction, the claim appears rather excessive in the light of the more recent estimate¹¹ that the reduced drag of trawls made from any high-strength

artificial fibres cuts down fuel consumption by about 5%.

Certain operational disadvantages of nylon nets had also become obvious, however; it was found that knots in the fibre had a tendency to slip, also damage was being caused to fish, particularly those caught in drift nets. It was recorded in 1954¹² that two nylon drift nets used by Newlyn vessels had fine threads and much damage was caused to enmeshed fish which tended to become caught in several meshes. Knot slippage, which itself most likely caused some damage to fish was overcome to a certain extent by heat-treating the netting. Critical factors in the wider problem of damage to enmeshed fish are probably mesh size and twine stiffness and not, as originally thought, the fineness of the thread.¹³ The difficulties experienced with the earlier drift nets made of continuous filament nylon have been overcome in later types and nets made of spun staple nylon have also proved successful.¹³

Nylon nets have been satisfactorily used during about the last five years in the south Kentish sprat fishery, and their cost, at about twice that of cotton nets, is offset by their higher yield and greater life.

Polyester nets were the second type to be made of high strength artificial fibres. These had a lower stretch but were more expensive than nylon nets and it was not until the introduction of nets made from polythene and polypropylene fibres in the late 1950's and early 1960's* that the use of

* In Fishing News No. 2337 of 31st January 1958, it was stated that for the first time Courlene X3, a polythene fibre produced by British Celanese Ltd., was to be tried in a deep sea trawl by a Hull vessel. Later that year widespread advertising of Courlene began. E.g.'s Fishing News No. 2359 of 4th July 1958. Fishing News No. 2379 of 21st November 1958. Trawl trials with "Ulstron", an I.C.I. polypropylene fibre were initiated in 1961 aboard vessels fishing out of Hull, Grimsby and Fleetwood. "Ulstron" Bottom Trawls. News-Sheet No. F.2 I.C.I. publication.

nets made from artificial fibres became widespread in the region. These nets are rot resistant, strong and, having a specific gravity of less than unity, lighter in weight than similar nets made from other fibres. They are also easy to handle and to knot and cheaper than equivalent nets made from nylon or "Terylene"* but more expensive than those of manila.

Trawler owners have been deterred from employing trawls made of nylon and polyester fibres partly by the high initial cost of the equipment coupled with the danger of losing it.¹³ Nets made from polythene and polypropylene fibres, with their low specific gravity, have been found to be less likely to foul obstacles on the seabed owing to their tendency to float.

Their introduction also coincided with the increasing use of Decca Navigator equipment which, indirectly, further helped to reduce losses of gear because of the improvement in navigation. The resultant increase in potential net life combined with their relatively low initial cost has encouraged owners to use nets made from these newer fibres.

The relative fishing qualities of the various fibres are difficult to assess partly because subjective judgment appears to have an important place in the final choice. There seems to be little doubt that braided nylon is suitable for drift nets and, while neither polythene nor polypropylene fibres cause undue damage to fish when used in these nets, their tendency to float makes them rather less useful. For use in trawls, the lighter fibres have become very popular and their floating characteristics help to ensure that the

*"Terylene" is an I.C.I. polyester fibre.

body of the net remains open.

It has been found by many fishermen that nylon nets, because they do not float, pick up more weed, starfish, etc. than those made of polythene or polypropylene, and their greater "limpness" increases their liability to become tangled. This same limpness has been put forward as an advantageous "softness" by a fisherman who also stated that nylon trawls did not chafe to the same extent as the stiffer polythene ones.

Overall, nets made from suitable artificial fibres are usually more productive than those of natural fibres and it is probably significant that the productivity of the Scottish inshore fleet has increased by 7% since the introduction of such fibres in trawl nets.¹¹

The uses of polythene and polypropylene netting have been extended in recent years to include coverings for shellfish pots all along the coast and the bags for oyster and scallop dredges. Other changes which have occurred in the principal types of shellfish traps from the standpoint of materials used in construction have been mentioned in the previous section.

Fittings made from synthetic materials have been used increasingly for fishing gear at the expense of those constructed from traditional ones. This has been particularly evident on trawl nets, where plastic floats have been used in the place of those made of aluminium, steel or glass; plastic does not deteriorate like aluminium or steel and is less liable to break than glass. Buoys for marking the positions of lines and shellfish pots were formerly made largely of cork, but this material is being superseded here by plastic, which is not subject to

deterioration, and can be obtained in bright colours so that the markers are easily seen and require no painting.

The use of synthetic substances is widespread in the fishing industry and, as long as products are developed which perform as well as or better than those made from more traditional materials and are competitive from a cost point of view, the new types will displace the existing ones if only because they are hardly affected by salt water.

Note

Few specific references have been used in this section but the following pamphlets have provided additional background information.

Facts about Man-Made Fibres - British Man-Made Fibres Federation.

British Nylon for Fishing Nets - British Nylon Spinners Publication.

"Terylene" for Nets and Twines - I.C.I. Publication.

"Ulstron" Bottom Trawls - I.C.I. Publication.

"Ulstron" Mid-water Trawls - I.C.I. Publication.

The Impact of Man-Made Fibres on the Fishing Industry -

A. von Brandt - Bundesforschungsaustalt für fischerei-Hamburg.

"Ulstron" Wing Trawls and Danish Seine Nets - I.C.I. Publication.

4. Subsidies Payable on Vessels and Equipment

Financial assistance for the purpose of re-equipment of the inshore fishing industry was first made possible by the Inshore Fishing Industry Act of 1945. As a result of the Act grants and loans were given, initially for acquiring equipment or new or second-hand boats, or for reconditioning but, from 1st October 1949, only for the purchase of new vessels and engines and second-hand ex-Ministry of Agriculture and Fisheries (but not ex-Admiralty) vessels. Grants were not made except in cases of need and were not permitted to exceed one-third of the cost of acquisition or reconditioning. It was not intended that these grants and loans should be provided after a period of five years from the passing of the Act, although provision was made for an extension of two years to be granted; the final expiration occurred in December 1952. For the purposes of the Act Inshore Fishing Industry meant the business of catching and landing in Great Britain fish, including shellfish, found in the sea, by boats not exceeding 70 ft. in length or 50 tons gross, but excluding boats wholly or partly used for herring fishing.

In May 1952 a memorandum was issued setting out the arrangements under which the White Fish Authority, which had then been in existence for one year, would make loans towards the purchase of new near and middle water vessels (i.e. those between 70 ft. and 140 ft. in length) or for reconditioning or improvement. As the provisions of the Inshore Fishing Industry Act 1945 expired at the end of 1952 the provisions of the memorandum were extended in February 1953 to include the inshore fleet, i.e. vessels of

less than 70 ft. in length. Under this scheme assistance for the purchase of second-hand vessels was no longer given.

Loans could be made of up to 60% of the cost of a vessel or of improvement or reconditioning (this included re-engining and conversion to motor power). Loans on new vessels were repayable within 20 years, and those on improved or reconditioned vessels within a shorter period.

As grants were no longer to be paid the new scheme provided insufficient incentive for the rebuilding of the fleet and left the inshore fisherman in a less fortunate position than before the expiration of the conditions of the 1945 Act. Consequently, the White Fish and Herring Industries Act of 1953 was introduced. It came into operation in May of that year and incorporated the substance of the memorandum and in addition made provision for the making of grants towards the cost of new inshore vessels (i.e. those less than 70 ft. in length) and new engines for inshore vessels operated by "worker-owners".

Under the Act, the White Fish Industry (Grants for Fishing Vessels and Engines) Scheme 1953, provided that the Authority might make grants of up to one-quarter of the expenditure for new vessels, subject to a maximum of £25,000. A larger percentage measure of help was given to certain owners of inshore vessels; a "working-owner" could receive on a boat costing not more than £20,000 a grant of up to three-tenths of the expenditure or £5,000, whichever was the less; he might get a grant of up to three-tenths of the cost of a new engine or £1,250, whichever was the less.

Vessels or engines for which the order was placed after the 31st July 1952 were eligible for the grant.

In addition to grants, the inshore fishermen continued to be eligible to receive loans. The Authority decided that a contribution of at least 15% of the cost of a new vessel or engine should be made by the owner from his own resources. A similar percentage applied to new near and middle-water vessels.

In March 1954 the Authority took a further step to encourage and support the inshore fishing industry by offering to make loans for the acquisition in certain circumstances, of nets and gear to be used in vessels of not more than 70 ft. in length. The circumstances in which loans were to be made were where nets and gear were acquired:-

- (a) as part of the initial equipment of a new vessel;
- (b) as a result of a statutory change in net mesh sizes;
- (c) as a result of a change (other than seasonal) in the type of fishing in a particular area.

The loans were to cover up to 60% of the cost and were to be repayable within three years. Most changes of gear were (and still are) as a result of normal wear, tear and loss and consequently were not covered by this scheme which, although still in operation, has not been used to a great extent by inshore fishermen.

Several changes affecting the fishermen of southern England have been made to the grants and loans schemes since their inception. The requirement that grants for the acquisition of vessels and engines should not exceed stipulated maximum amounts was finally removed in 1966¹⁴

following amendments to these maxima in 1956,¹⁵ 1959,¹⁶ 1962¹⁷ and 1964.¹⁸

Under the provisions of the Sea Fish Industry Act 1962, the upper limit of 140 feet on the length of new trawlers, for which grants and loans might be provided, was removed. The effect of the Act in the south of England was limited and the principal relevant alteration related the rate of grant to the length of vessel instead of to whether the boat had a working or a non-working owner. The grant of 30% was to be payable on vessels of less than 80 ft. in length and the one of 25% on larger vessels. At the same time the White Fish Authority altered the loans arrangements slightly - up to 60% of the approved cost of vessels of over 80 ft. in length could be borrowed, but only by applicants who could not obtain the money on the open market at reasonable rates of interest.

In 1962 a change was also made in the loans arrangements when for the first time since 1952 loans could be given for the purchase of second-hand vessels. These loans were available only to inshore fishermen, and the action followed a recommendation of the Committee of Inquiry into the Fishing Industry in 1961.¹⁹ Advantages were to be gained by both buyer and seller; the former was now better able to get financial assistance if he wished to purchase a second-hand vessel which suited his needs, while the latter was presented with a greater opportunity of obtaining a higher price by disposing of the vessel to someone able to use it for the purpose for which it was best suited.

Nevertheless, the arrangements were not widely used and in the south-west only five vessels were purchased with this aid; since 1965 it has been in suspension.²⁰

From 17th January, 1966 the level of grant was increased to 40% for vessels below 80 ft. in length and to 25% for larger craft.*¹⁴ This alteration was consequential upon the change in general Government policy, as set out in the White Paper, "Investment Allowances", Cmnd. 2874, of replacing Investment Allowances by Investment Grants for tax purposes. It was stated in the White Paper that "Fishing vessels will not be eligible for Investment Grants but will continue to receive grants under fisheries legislation. These grants will be specially adjusted to take account of the abolition of Investment Allowances. Fishing vessels will also continue to qualify for free depreciation." Under these arrangements all improvements might be carried out with grant aid.

General improvement grants had previously been available, but only for inshore vessels, between 1945 and 1949 under the terms of the Inshore Fishing Act 1945. Grants have been provided for re-engining more widely and for much longer but, between 1949 and 1964, only loans were given for other improvements. Unfortunately a scheme introduced in 1964²¹ covered too narrow a range of alterations and therefore was little used.

Since 1st January, 1967 grants have been increased by 5%²² to provide an extra incentive to modernise the fleet. At present it is intended that this payment will be made until 31st December, 1968.

* The maximum loans available were reduced so that in each instance at least 15% of the total purchase price was to be paid by the owner.

Throughout the post-war period the inshore section of the fishing fleet of southern England has derived considerable benefit from the schemes. Indeed, if it had not been for the assistance provided there would almost certainly be many fewer vessels fishing to-day than in fact there are.

Note:

Although in this section considerable use has been made of the Annual Reports of the White Fish Authority, specific references to them have been omitted.

5. The Size of Meshes of Fishing Nets and Legislation

Conservation of fish stocks has long been a major problem for the fishing industry, and the regulation of net mesh size has presented a possible solution to part of the problem. Regulations concerning mesh size have the disadvantage of being difficult to enforce; resentment has often been caused when British fishermen, whose activities have been controlled fairly rigidly, have seen foreign vessels fishing the same grounds and coming into the same port with nets having under size meshes.

Although different regulations have been and still are in force for vessels fishing more distant waters, this section will deal solely with regulations affecting the fishermen of southern England.

The general regulations applying in 1945 were those prescribed in 1937 by the International Convention on the Regulation of the Meshes of Fishing Nets and the Size Limits of Fish which stipulated that the minimum mesh size should be such that the largest flat gauge, 2mm thick, which could be pushed through this mesh when wet was 70 mm

wide. This and other conservation measures in force were felt to be inadequate and consequently international conferences were held in London in October 1943 and in March 1946 to discuss the problem and suggest appropriate action. One of the final recommendations emanating from the latter gathering was that the minimum mesh measurement of 70 mm be increased to 80 mm. The Convention of 1946, produced as a result of the Conference, was finally ratified by Spain in February 1953 and was due to come into force two months later²³ but when the Permanent Commission, which was set up under the Convention, held its first two meetings in London in May and November 1953, it was decided at the second of these meetings that during a transitional period of two years the minimum size of mesh to be used in the area under consideration should be 75 mm, but that the Convention should be modified to permit seine nets with a mesh size of 70 mm to be used in the areas where a mesh size of 80 mm had been prescribed. These measures came into force in all participating countries on the 5th April 1954 and those for the United Kingdom were contained in the Sea Fish Industry (Fishing Nets) Order, 1954.²⁴ *

* Some Sea Fisheries Committees, Cornwall being among them, were given permission by the Minister to make By-laws to the effect that the minimum mesh size to be used in their areas for trawl nets, should be 1½ in. on each side (or 6 in. around the four sides) when wet. This was little different from the measure accepted by the Permanent Commission and had the advantage for British users of being more practicable administratively.

A further exception was made when, in September, 1955, it was recommended that light trawls should be permitted to have a mesh size 5 mm smaller than that for other trawls (i.e. 70 mm); the Sea Fishing Industry (Fishing Nets) Order, 1956, was published in April, 1956, to give legal effect in the United Kingdom to this recommendation.²⁵

Other exemptions have been concerned with sprats, herrings, shrimps and other species for which a mesh smaller than 75 mm must obviously be used. Inevitably, when smaller-mesh nets were employed, under-sized fish of protected species were caught. The Commission wished to take this into account, without encouraging deliberate fishing for these under-sized specimens, and amended the Convention in May, 1954, to permit herring fishermen and other fishermen not fishing for protected species to include under-sized fish of protected species to the extent of 10%, by weight, of the landings.²⁶

After 1953, meetings of the Permanent Commission were held annually, except in 1959, when there was no meeting, until the final gathering took place in May 1963 and at last recommended that the minimum size for the mesh in any part containing sisal or manila of a trawl net be increased from 75 mm to 80 mm.²⁷ Earlier meetings had just granted extensions to the period during which the 75 mm mesh was allowed. The minimum for any part made of other materials remained at 75 mm for double twine and 70 mm for single. Consequently, as the cod-ends* of few trawl nets were, by

* The mesh of which the cod-end or centre bag of the net is made is of prime importance for the mesh in the wings (or sides) is usually larger.

this time, made of sisal or manila, the recommendation, which was given legal effect in this country from 1st June, 1964, by its incorporation in the Sea-Fishing Industry (Fishing Nets) Order 1964,* had little practical effect.

The Commission established under the 1946 Convention was succeeded by another Permanent Commission which was set up under Article 3 of the North-East Atlantic Fisheries Convention of 1959, which replaced that of 1946 and covered several conservation measures not mentioned in the earlier one but made no changes in mesh sizes. It was ratified in 1963 and the first meeting of the new Commission took place in London in September 1963²⁷ and concerned itself purely with procedural matters; the recommendations of the subsequent annual meetings have not affected the southern area.

*After the introduction of the Fishery Limits Act 1964, this order was replaced by the Sea-Fishing Industry (Nets on British and Foreign Fishing Boats) Order 1964 which made no alteration to the minimum mesh sizes but included foreign fishing vessels inside the fishing limits of the British islands within its scope.

1. An Account of the Fishing Gear of England and Wales - F.M. Davis. H.M.S.O. Latest edition 1958.
2. M.Sc. Thesis (University of London) T.D. Kennea. 1957.
3. Quarterly Report of the Fishery Officer for the Cornwall Sea Fisheries Committee for the period ending 22nd May 1946.
4. Experiments on the Cornish Pilchard Fishery in 1947-8. William C. Hodgson and Ian D. Richardson. H.M.S.O. 1949.
5. Fishing News No. 2269. 12th October, 1956.
6. Fishing News No. 2464. 28th August, 1960, where an account of the equipment is given. Detailed information may be obtained from Kelvin Hughes publicity literature.
7. Fishing News No. 1778. 10th May, 1947.
8. Fishing News No. 1842. 31st July, 1948.
9. Fishing News No. 2037. 3rd May, 1952.
10. Fishing News No. 2218. 21st October, 1955.
11. Applied Plastics. August 1963. The Scientific Press Ltd.
12. Report of S.F.O. for Cornwall Sea Fisheries Committee for period ending 20th August 1954.
13. Plastics - September 1962 - Pps 68-69.
14. The Fishing Vessels (Acquisition and Improvement) (Grants) Scheme 1967.
15. The White Fish Industry (Grants for Fishing Vessels and Engines) Scheme 1956.
16. The White Fish Industry (Grants for Fishing Vessels and Engines) Scheme 1959.
17. The White Fish Industry (Grants for Fishing Vessels and Engines) Scheme 1962.

18. The White Fish Industry (Grants for Fishing Vessels and Engines) (Amendment) Scheme 1964.
 19. Report of the Committee of Enquiry into the Fishing Industry under Sir Alexander Fleck (Cmd. 1266). H.M.S.O., 1961.
 20. Personal Communication from A.Sharples of the White Fish Authority. 21st September, 1967.
 21. White Fish Industry (Grants for Improvement of Fishing Vessels) Scheme 1964.
 22. The Fishing Vessels (Acquisition and Improvement) (Grants) (Amendment) Scheme 1967.
 23. Annual Report of the White Fish Authority for the Year Ending 31st March, 1953.
 24. Annual Report of the White Fish Authority for the Year Ending 31st March, 1954.
 25. Annual Report of the White Fish Authority for the Year Ending 31st March, 1956.
 26. Annual Report of the White Fish Authority for the Year Ending 31st March, 1955.
 27. Annual Report of the White Fish Authority for the Year Ending 31st March, 1964.
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CHAPTER 5

FISHING VESSELS AND GEAR (2)

1. Demersal Fish

Trawling and lining have, throughout the period, been the two principal methods by which demersal fish have been caught in the region (Figs. 8 and 10).

The reasons for the use being made of one method rather than the other are often difficult to determine and tradition may well play a considerable part. It will be seen that the theory¹ that lining is favoured in areas which are either too rocky or too deep for trawling does not always hold true in the southern area. Overall, trawling is of considerably greater importance but lining is widespread throughout the area, being concentrated mainly in parts of Cornwall, where it is carried out principally in the spring and early summer, and at Folkestone where the fishery takes place during the winter. A few vessels have fished by this method throughout the year from both areas.

Folkestone liners are used for trawling during the remainder of the year but fish with lines for turbot, skate, dogfish, conger eel and other larger fish during the winter when flat fish, which form a large part of their summer catches, move from the inshore grounds preparatory to spawning in the spring. Although conger eels are usually caught in rocky areas, turbot and skate are mainly landed from the relatively shallow Varne, La Colbart and Bullock Banks. Here the ground is fairly smooth but the considerable strength of tidal flow makes lining a more practicable method of fishing than trawling.² Because of their distance from the shore these grounds are exploited by the larger liners;

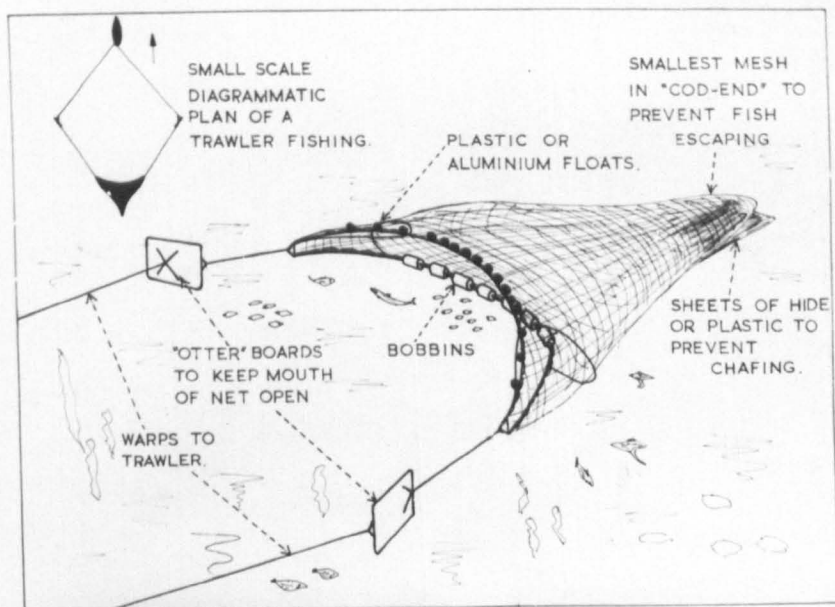


FIG. 8 A trawl in operation.

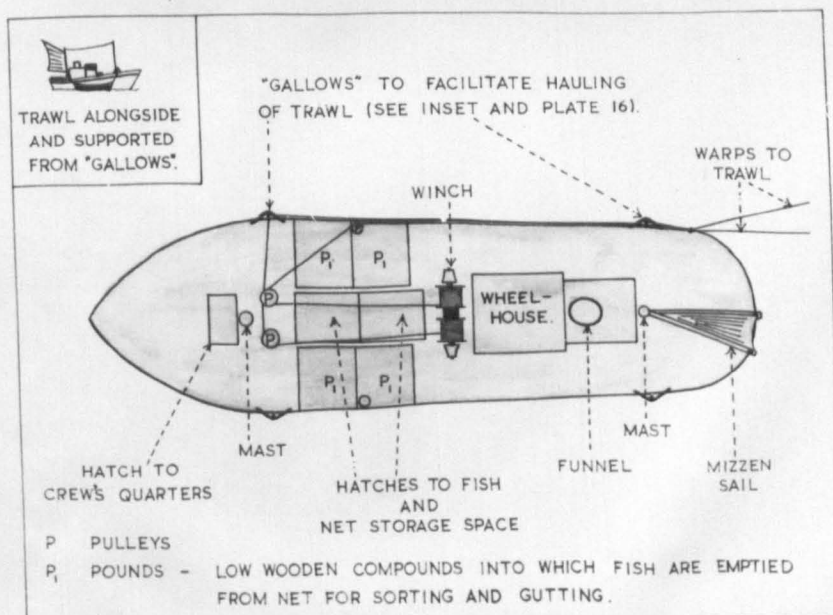


FIG. 9 Deck layout of a medium size south coast trawler.

the smaller vessels fish closer to the land.

The pattern of fishing at Folkestone has changed little during the post-war period except that its scale has been gradually reduced. Greater changes have, however, occurred at Newlyn, the most important of the line fishing ports in Cornwall and, indeed, in the whole region. After the war there was little trawling from the port except by Belgian boats and line fishing was by far the most important method of catching demersal fish by British vessels. The success of these foreign trawlers was probably largely instrumental in bringing about the introduction in 1947³ of the local British trawling industry.

Again, the importance of lining at Newlyn and, indeed, at other Cornish ports has not been entirely due to fishing conditions. Even before the war trawlers from Brixham used to make Newlyn their base while fishing in the south-western waters. Why then did the larger local vessels persist with line fishing?

Certainly there are many rocky areas in the vicinity, and some of the grounds prosecuted by liners were and still are too deep to be fished by even the largest trawlers used in Cornish waters. But many of the grounds were fairly smooth and in depths where trawling could take place and one is left with three, perhaps inter-related, possibilities to account for the popularity of lining in such regions: tradition, convenience, cost.*

* There is a history of Nonconformism in Cornwall and this has meant that Sunday fishing has often been precluded. Consequently, some of the crew members for the Stevenson trawlers have come from Lowestoft. This antipathy towards working on Sunday should not be regarded as a major reason for the delay in the introduction of trawling at Newlyn for trips less than one week in duration could easily have been made, though they would have been less profitable.

The latter two appear to have been particularly important. Line fishing fits in very well with pilchard drifting, which is the other main activity of many of the vessels, as little modification is required to convert from one method to the other and the crew requirements of both systems are almost identical. This combination also ensures that the boats can be operated for most of the year with only one expensive type of gear, the drift net, and one relatively cheap type, the line. On the other hand, if trawling is the form of demersal fishing practised, not only does it necessitate the purchase of fairly expensive gear but also the addition of winches, pulleys and gallows for hauling and letting out the trawl; to change this equipment every time the vessel altered its mode of fishing would be time consuming and costly, but to leave it in place while drift fishing would severely hamper operations.

Newlyn continues to be the main port for liners but trawling has become more important and since 1956 there have usually been more larger trawlers than liners (Table 21). The decline in line fishing has been largely an effect of reduced catches combined with rising prices. Fish have become scarce on grounds which have been subjected to intensive trawling, initially by foreign vessels, some from Brixham and a few other British stations and, more recently, also by the Newlyn fleet.*

Even some of the rougher grounds, previously exploited almost solely by liners, have received the same treatment as

* In the Quarterly Report for the S.F.O. for Cornwall for the period ending 9th November 1957 it was stated that "On all the chief longlining grounds numerous trawlers of various nationalities are present, and it is attributed to this intensive trawl fishing that there has been a decline in the catches of the liners."



Plate 7A



Plate 7B

92 ft. trawler "Roger Bushell" in Brixham Harbour.

TABLE 21

Number and Types of Fishing Vessels at Newlyn

Year Ending 31st Dec.	Trawlers		Liners		Others		Total	
	<u>1st Class or over 40 ft. in length</u>	<u>Others</u>	<u>1st Class or over 40 ft. in length</u>	<u>Others</u>	<u>1st Class or over 40 ft. in length</u>	<u>Others</u>	<u>1st Class or over 40 ft. in length</u>	<u>Others</u>
1952	10	3	3	4	14	12	27	19
1953	10	4	3	4	13	14	26	22
1954	15	3	14	5	1	12	30	20
1955	15	4	16	8	0	9	31	21
1956	17	7	15	11	0	9	32	27
1957	17	7	16	13	0	10	33	30
1958	17	6	15	17	0	9	32	32
1959	18	5	16	27	0	9	34	41
1960	17	5	17	30	0	8	34	43
1961	17	3	12	38	0	9	29	50
1962	20	3	11	46	0	8	31	57
1963	21	5	8	41	0	6	29	52
1964	20	4	8	52	1	10	29	66

Source: Derived from Sea Fisheries Statistical Tables.

trawling techniques have improved and it has become possible, by having larger bobbins on the foot-ropes (Fig. 8) for the trawls to be made to pass over many of the obstructions on the sea-bed. The trawl is more destructive of marine life than is the line and the liners' catches decreased, thereby causing the vessels to fish farther afield; many indeed gave up lining in favour of trawling and since 1960 there has been a marked reduction in the number of large liners (Table 21). In the last few years however those remaining have been making very good catches on grounds not subject to intensive trawling.

The figures indicate an increase in the number of liners between 1953 and 1954; this was probably because the vessels were carrying out other methods of fishing in addition to lining and prior to 1954 they were grouped under the heading "Others".

A further factor which has militated against line fishing is the difficulty experienced in obtaining crews, for while one of the larger south coast liners needs six or seven men to be operated successfully, a trawler of the same size can be worked with a crew numbering only two or three.

The situation has also been aggravated by the scarcity of pilchards, which in the past have been a major source of bait for the lines. Squid has been a popular form of bait in the last few years but has been in demand for human consumption, particularly on the French market; the fisherman cannot pay the high price now asked and have tried other forms of bait, such as deep-frozen mackerel,

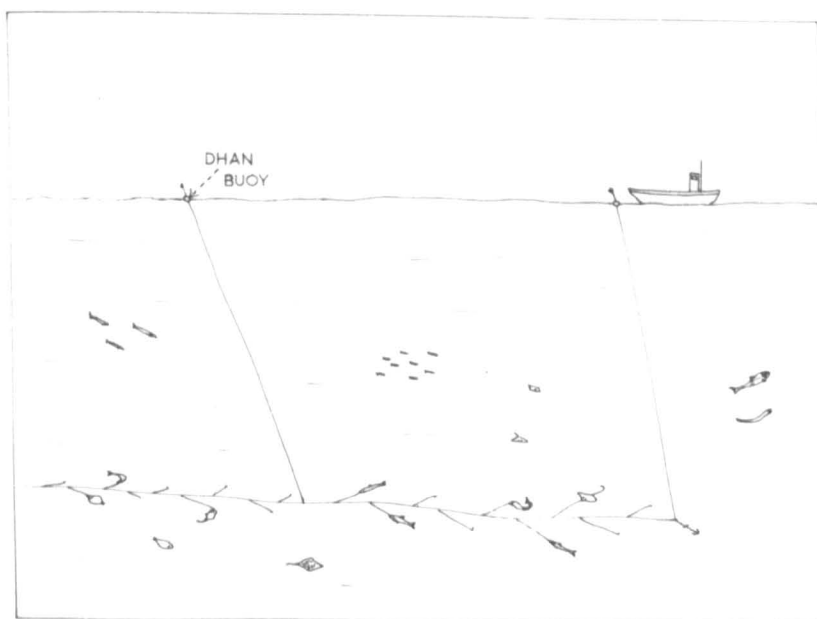


FIG. 10 Line Fishing.

THERE WOULD NORMALLY BE MANY MORE HOOKS ON A LINE THAN ARE INDICATED IN THIS SKETCH. ONE OF THE LONGER LINES USED IN CORNISH WATERS MIGHT EXTEND FOR $7\frac{1}{2}$ MILES; AT FOLKESTONE, LINES OF $2\frac{1}{2}$ MILES IN LENGTH ARE USUAL.

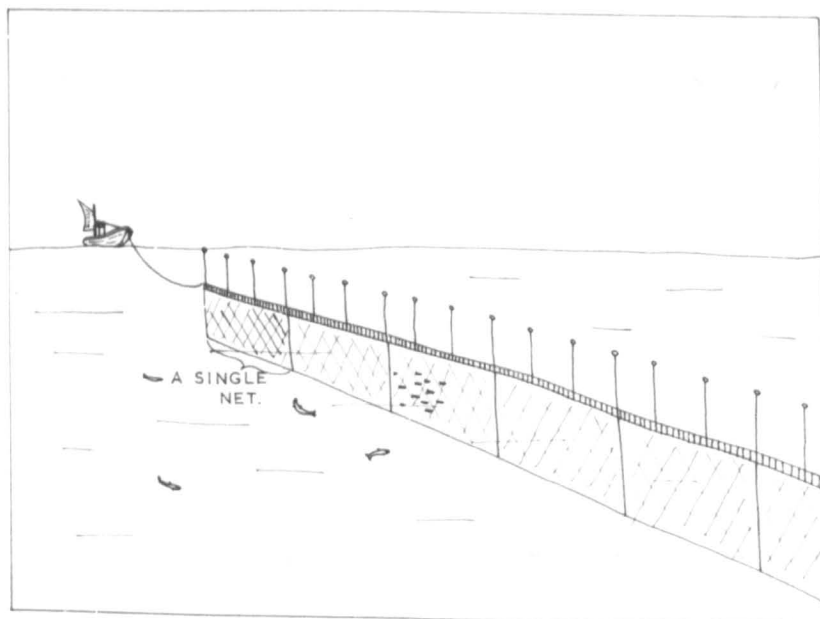


FIG. 11 Drift-net Fishing.

FOR PILCHARD FISHING EACH NET MAY BE BETWEEN ABOUT 60 YDS. AND 120 YDS. IN LENGTH; A SMALL BOAT MAY FISH AS FEW AS EIGHT AND A LARGE VESSEL AS MANY AS 35. BOTH MACKEREL AND SPRAT NETS ARE NORMALLY SMALLER BUT AN EAST COAST MACKEREL DRIFTER MIGHT USE AS MANY AS 180; A KENTISH SPRAT BOAT EMPLOYS ABOUT 6.

sprats and herrings, but in no case do these fish as well as the normal bait.⁴

In addition to vessels from Newlyn, a few have operated with lines throughout the year from St. Ives, but most Cornish vessels engaged in line fishing have fished only in the seasons when they have not been drift-fishing for pilchards. Unfortunately, pilchard catches, which were for many years the mainstay of much of the Cornish fishing industry, have become small and unreliable and this, combined with the other difficulties, has compelled many fishermen to forsake line fishing either in favour of some other more profitable form of fishing or, in older men, of final departure from the industry. This has been occurring not only at Newlyn and St. Ives but also at Looe, Mevagissey, Porthleven and other smaller Cornish ports.

While lining has decreased in significance, trawling has also generally become less important, but not to such a marked extent and it has already been noted that at a few centres, other than Newlyn, there has recently been a marked resurgence. The most notable of these is Brixham and other examples are seen near the eastern extremity of the English Channel at Newhaven, Hastings and Rye.

At Newlyn and several other ports the catches made by smaller vessels have been decreasing and the cost per unit catch has risen; these vessels, which have frequently been operated by owner-skipper, could not safely fish much farther afield, and have often been sold and sometimes replaced

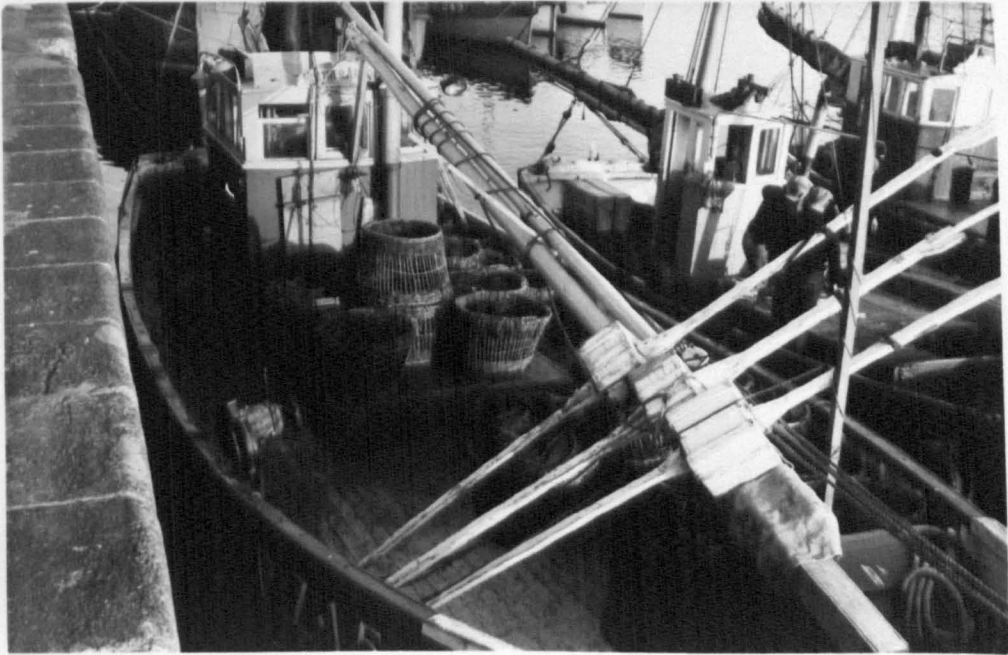


Plate 8 A Newlyn liner. Baskets of coiled lines are on the deck. In the foreground are buoys for marking the position of the lines when set. The motor line-hauler is on the starboard side.

by even smaller vessels more suitable for taking part in the holiday industry in the summer and for fishing during part of the other seasons. These latter vessels require fewer crew members and therefore give the owners a greater degree of independence.⁵ It is expected that, as direct and overhead costs should be reduced to a greater extent than the reduction in income from catches and other sources, the vessels should be able to operate more profitably.

The increase in the number of large vessels at Newlyn, as Stevensons expanded their activities, is well illustrated in Table 22; so also is the accompanying decrease in this type of boat elsewhere.

TABLE 22

Vessels over 70 ft. in Registered Length
Fishing from Southern Ports

	<u>1948</u>		<u>1953</u>		<u>1958</u>		<u>1961</u>	
	<u>Steam</u>	<u>Motor</u>	<u>Steam</u>	<u>Motor</u>	<u>Steam</u>	<u>Motor</u>	<u>Steam</u>	<u>Motor</u>
Ramsgate	1	2	0	2	0	0	0	0
Poole	0	0	0	1	0	0	0	0
Brixham	0	10	0	7	0	5	0	4
Plymouth	6	0	1	1	0	1	0	2
Mevagissey	0	1	0	0	0	0	0	0
Newlyn	1	4	0	7	0	12	0	12

Sources: White Fish Authority Annual Report for the year ending 31st March, 1954.

Sea Fisheries Statistical Tables.

In recent years Plymouth has been the only port, apart from Newlyn, where the number of vessels over 70 ft. in length has increased. Such vessels have fished from Poole and Mevagissey for short periods since the war but these

stations have never been major centres for such boats and numbers did not increase. The vessel at Mevagissey ceased to operate there in 1949 and the one at Poole, which started fishing from the port in 1951, left it in 1955. The Ramsgate fleet, which operated largely in the southern North Sea, was finding itself at a disadvantage owing to the distance of the port from the principal North Sea grounds, the scarcity of fish near at hand and the difficulty of obtaining crews. Some of the vessels were moved to ports from which they could fish more economically,⁶ and by the end of 1956 there were no vessels of over 70 ft. in length fishing from the port.

The largest fleet of steam trawlers was operating from Plymouth in 1948; these vessels were old and uneconomic in operation and were gradually withdrawn from service, the last remaining one ceasing to fish in 1955.⁷

At Brixham there were nine trawlers over 90 ft. in length in 1950.⁸ One was lost in 1951, presumably having been sunk by a mine^{9 10 11} but further reductions occurred and by 1954 the number was six.¹² Five of these vessels were owned by Torbay Trawlers Ltd. and the sixth was managed by them for another owner. The same number was still operating until three were sold to Stevensons at Newlyn^{13 14} in 1962. The remaining three continued to fish from Brixham, two having been sold to the newly formed Fresher Fish Co., Ltd.¹⁵ and the remaining one still being managed by Torbay Trawlers, Ltd. By early 1965 the Fresher Fish Co., Ltd. became bankrupt having been beset by mechanical and human problems and a certain degree of bad luck,¹⁶ its two vessels were sold away from the port, leaving only one

trawler over 90 ft. in length; this boat has continued to fish from Brixham since Torbay Trawlers, Ltd. was sold out to the co-operative Brixham and Torbay Fish Co.

The loss of larger boats has been compensated by the increase in the size of the fleet of powerful vessels mainly in the 40 ft. to 60 ft. category. This reflects the growing prosperity of many individuals and the overall revival of the fishing industry here, particularly since the formation of the co-operative. As the fishing grounds relatively near at hand have been yielding good catches, the longer voyages of which the big vessels are capable show few advantages, particularly as the smaller vessels, by landing more frequently, bring their fish ashore in a fresher condition.

The recent acquisitions have been mainly obtained second-hand, largely because of the almost prohibitive cost of new craft; several of these vessels have been obtained from Belgium where prosperous trawler-owners have been replacing their boats while still in a reasonable condition.

Early in 1967 two Brixham vessels were converted to stern-trawling (Plate 9). It is too soon to judge if the experiment has been a success but the method has been employed increasingly on new deep-sea trawlers from this and other countries.

Some probable reasons for the lack of success of the large trawlers at Brixham are not very difficult to find although there are other factors whose importance, while unknown, may have been considerable. Among these, the quality of management must be placed high upon the list and the finance available for maintenance and general monetary backing is also an important consideration.

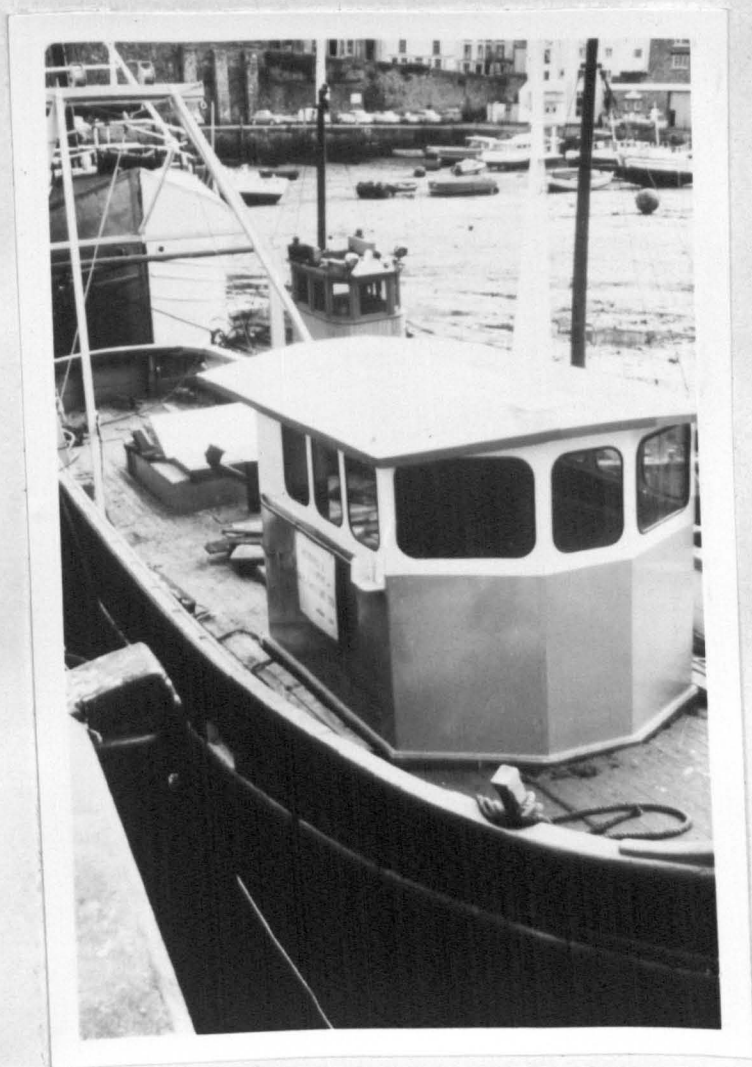


Plate 9 Trawler being converted in
Brixham Harbour for stern fishing.

Some of the more obvious problems were associated with fishing areas; the grounds near-by were often not sufficiently productive to enable economic catches to be made by such vessels and, when the more distant grounds at the western end of the English Channel, in the Celtic Sea and in the British Channel were fished, an excessive and costly proportion of each voyage was spent travelling rather than fishing. This disadvantage was sometimes overcome by landing catches at ports such as Padstow and Newlyn which were nearer to the fishing areas.

The recent expansion at some of the south-eastern ports is based on a fishery conducted by vessels less than 50 ft. in length and owned by individuals. There is little place here for the economic operation of larger boats. In the extreme south-west the inshore grounds suitable for trawling are limited in extent and have been subjected to intensive fishing. Many of the fishing grounds which give a good yield are over 70 miles from Newlyn. To fish safely at this distance from the port, which represents about eight hours steaming time, fairly large vessels are needed, and if such vessels are to operate economically they must return to port with a good load of fish. This generally means staying at sea for about ten days. Frequent journeys to port with small loads of fish are obviously uneconomic.

Most of the grounds fished by vessels from the Sussex ports are within 10 miles of the shore. It is generally felt that as the travelling time from port is relatively short there is little advantage in remaining at sea for long periods for, while the cost per unit landed would be smaller if the duration of the trip and the size of the

catch were increased, this might be offset by the reduction in the selling price of much of the fish. This must also hold true for the Newlyn vessels, but the considerable distance of the grounds from port and the relative richness of the distant grounds compared with those inshore make the lengthy trips worthwhile. The increasing numbers of vessels fishing from Newhaven, Hastings and Rye can be attributed to the good fishing available in Rye and Hythe Bays and the consequent prosperity of the fishermen, which enabled crew members to purchase their own boats and encouraged young men to enter the industry. The growth at Rye is particularly noteworthy for, from just after the war until the late 1950's, there was virtually no fishing there. During the war the port had harboured many trawlers from other parts of the country (Chapter 2), but when the war ended these vessels returned to their home ports and the local fishery declined until by 1951 there was very little trawling. The subsequent revival started in 1959 after two of the larger Hastings boats were brought to the port, from which it was easier to work and the problems of launching from a beach were avoided. Other Hastings fishermen soon followed and, from then onwards, several Rye people saw that the fishery was a profitable undertaking, acquired bigger boats and got local crews to work them.¹⁷ Rye itself by no means has ideal harbouring facilities for berthing space is limited and the long, narrow approach channel is navigable only near or at high-tide. Nevertheless, it does provide shelter and landing facilities conveniently near to Rye Bay. There are now (October 1967) 16 vessels working full-time from the port,

of these two are over 40 ft. in length; in 1958 there were only four boats fishing full-time and all were less than 40 ft. long.

The vessels used at Hastings are slightly smaller than the Newhaven ones as they have to be hauled on the beach, whereas the mouth of the River Ouse provides the latter port with one of the best harbours in the south-east. The trawler fleet at Hastings has been relatively prosperous throughout the period and continues to be one of the most modern fleets of vessels in the region; in 1964 twenty of the twenty-two vessels fishing from there full-time had been built between 1953 and 1961.

Although trawling and lining have been the two principal methods of catching demersal fish throughout the period, a few other methods have been of local importance. One of the most recently introduced of these has been "pair-trawling" for skate in the Thames estuary. This type of fishing, which consists of towing a net between two vessels was introduced about 1950 as a summer supplement to the winter sprat fishing. It was also tried in the summer of 1963 by Whitstable fishermen off Folkestone, but the experiment was unsuccessful and has not been repeated.

In the winter of 1963-64 one long-liner from Newlyn attempted Danish seining with limited success.⁴ This is worthy of note as it is a method of fishing which has become increasingly popular with Scottish and English fishermen in the last 30 years. It is most generally employed for catching demersal fish from the Scottish East Coast, but is also used from the West Coast and from some English ports where fishing is conducted in the North Sea and

the Irish Sea.¹ There had been earlier attempts to employ this method in Cornish waters but it has never become popular.^{19 20 21 22 23}

2. Pelagic Fish

Pelagic fish tend to congregate in shoals of one species, whereas different types of demersal fish exist in close proximity. Although one type of demersal fish may predominate in one area, such as flat fish off the Kent and Sussex coasts and skates and rays off the Cornish shores, the fishery is nevertheless conducted for demersal fish generally. With pelagic fish, because of their shoaling tendency, fisheries are conducted for one type of fish and, because of the differing behaviour of the various species, different methods are often employed for their capture. The methods of catching the principal types of pelagic fish will be dealt with in turn.

(a) Pilchards

As catches have become increasingly uncertain and the disposal of gluts has become a major problem, the number of boats taking part in the pilchard fishery has decreased, but nevertheless drift-fishing from vessels mainly between 25 ft. and 45 ft. in length has been the principal method of catching the fish off Cornish shores throughout the period (Fig. 11).

The fish are usually caught in the evening when the shoals, which had spent the daylight hours near the sea-bed, rise and disperse.

Other methods of catching pilchards have been experimented with but they have not met with any considerable measure of success over an extended period. Ring netting (Fig. 12) involved surrounding the fish with a wall of net and then pulling the net containing the fish into the boat. It had been highly successful in sheltered Scottish waters for catching herring and was employed for catching pilchards in 1947 and 1948 by a Ministry of Agriculture and Fisheries Research vessel and a Scottish ring-netter. An echo sounder has been used to locate the fish which were landed in good condition much more quickly than fishermen using conventional methods could shoot and haul their nets and disentangle their catch. To learn more about the method, the Ministry of Agriculture and Fisheries arranged for six Cornish fishermen and the Cornish Fishery Officer to go to Ayr to take part in the local fishery in 1948.²⁴ Despite this interest and the apparent possibility of success the method was never adopted. The results of the early experiments were variable although large catches were made when the weather was good and shoals were tightly packed. The reasons for these conditions being necessary are as follows:-

1. Ring netting requires vessels to fish in pairs; the boats spend some time operating alongside each other and this can safely be done only in relatively calm conditions.
2. The ring net size is a limiting factor and if the shoal is widely spread out, only a small number of fish are encircled. A ring net suggested by Ministry of Agriculture and Fisheries scientists as suitable for the pilchard fishery was 260 yards

in length²⁵ i.e. the diameter of the ring enclosing a shoal of fish is approximately 80 yards.

Trials with a ring net operated by only one vessel were also carried out and Spanish fishermen, who used the method regularly at home, visited Mevagissey in 1952 to work a local boat.²⁶ Presumably these experiments met with little success but a similar method was tried early in 1958, when a single boat ring-net operated by a St. Ives vessel was successful under favourable circumstances.²⁷ Doubts were expressed concerning the effectiveness of this method outside of the winter shoaling period.²⁷ *

The catches made with ring-nets in daylight were small,²⁵ even from areas where good echos had been obtained. A similar lack of success has accompanied daytime purse seining** experiments even when there has been evidence of good concentrations of pilchards,²⁸ but it should be remembered that drifting is also unsuccessful in daylight and in this respect ring-netting is therefore no worse.

The crews of the two Mousehole boats experienced several other problems. The footrope of their net fouled obstacles on the sea-bed and caused damage to the net. They experienced obvious difficulties when operating in areas where drifters were close together. The night-time dispersal of shoals meant that fishing time was limited and

* More recently, the winter pilchard fishery has been a complete failure and the fish have not appeared inshore in quantity during this period (page 246).

** Purse-seining is a method which, in many respects, is similar to ring-netting, but the sides and bottom of the net are closed, like a purse, before being landed. In Cornwall it has been used with only one vessel.

if shoals were not located at an early stage the evening was wasted.* It was again shown that drifters had the advantage in rough weather and it was felt that there was little hope of future development of this method because of these difficulties, despite the fact that the earnings of these vessels had been equal to those of the most successful drifters.²⁹

The possibility of variable and occasionally large catches provided one further and major problem which resulted from ring-netting, that of processing and distributing irregular and variable catches of fish. Although drifting may be regarded as a passive form of fishing making catches of limited size, landings were in the main more stable than those made by ring netters, partly because the drift fishing vessels could operate in a greater variety of weather conditions. The fish caught by drifters should have less variation in size than those caught by ring netters, for the drift net allows the smaller fish to pass through the mesh and the larger ones cannot get their heads into the meshes. While the ring net allows many of the smaller fish to escape through the meshes the larger ones are trapped. This lack of selective action puts the ring net at a disadvantage for supplying the canners, who require fish to be of almost uniform size.

Other factors have also militated against the general use of the ring net in Cornwall. Among the most important are the cost of changing to the new method of fishing and the unwillingness, on the part of the fishermen, to forsake

* Later work in purse-seining by the Pilchard Development Unit (page¹⁶⁴) showed that it was best to locate the shoals in daylight and stand by them until dusk before shooting the net. This must also hold true for ring-netting.

a method which, for at least the last sixty years,³⁰ has provided an important part of their income. Added to these is the major consideration that more recently pilchards have appeared less in the tightly packed shoals which are a prerequisite for successful ring netting.

Consequently, despite the initial success of experiments with a ring net, the operational and marketing disadvantages associated with the method outweighed its advantages, particularly as so much was dependent upon weather. The conservatism of fishermen probably did little to help.

Trawling for pilchards has been tried on occasions with varying degrees of success. Catches have sometimes been large and this has presented distribution difficulties and raised the animosity of the drifter fishermen. In the winter of 1945, when two fishermen from Looe were making considerable catches of pilchards by trawling (average 800 stones of fish per boat in a few hours, when it would take a drifter crew 12-16 hours to catch and unmesh a similar quantity) the pilchard drifter men threatened to boycott the merchant if he took trawled pilchards. The experiment ceased until 1947, when a greater number of small vessels started trawling from Looe with considerable success.³¹ In the summer of 1948 the two fishermen mentioned above successfully tried ring netting. The boycott was again threatened so their fish were sold at a reduced price to a Mevagissey merchant. In 1949 both trawl and ring net proved unsuccessful and by 1950 only one pair of ring netters was operating³² but the method continued to be used on a small scale^{33 34} for a few years.

During the summer of 1950 two vessels from Whitstable operated a pair-trawl for pilchards in the Mount's Bay and Mevagissey areas and made negligible landings when drifters were having good catches.³⁵ The trials were discontinued but further experiments with similar equipment were carried out by the two Looe fishermen who had made earlier trials with a trawl and a ring net. The fishermen signed an agreement with canners to supply them with all pilchards caught so that any threatened boycott of merchants by other fishermen would be ineffective. A petition was drawn up by 150 fishermen of Looe, Polperro and Mevagissey in an attempt to prohibit trawling for pilchards in Cornish coastal waters. A counter petition was signed by 35 fishermen of Looe in favour of the use of trawl nets for pilchards. These were put before the Cornwall Sea Fisheries Committee on 30th July, 1952, and it was decided that trawling would not be harmful to the fish stocks and the by-laws should remain unamended.

None of the results of the trials was sufficiently conclusive to warrant a widespread method change, and in 1955 further experiments with pair trawl (pp 168-170) and ring net were carried out by two Whitstable vessels, which had been chartered by C. Shippam Ltd. Chichester.*³⁶ Success

*It was reported in Fishing News No. 2194 of 6th May 1955 that a ban on pilchard trawling in Cornish waters had been brought about by a petition brought by Cornish fishermen to the Cornwall Sea Fisheries Committee. In their trials the Whitstable fishermen trawled outside the three-mile limit but used the ring-net inside.
(Fishing News No. 2219. 28th October, 1955.)

also evaded this work,³⁷ but Shippams were sufficiently encouraged to carry out additional trials with a midwater trawl, this time with a single vessel instead of a pair, in the winter of 1957-1958.³⁶ * Some good catches were made but it was found that a wind strength of above Force 4 or a heavy ground swell made the gear difficult to handle.³⁶

The outcome of this later work did no more to justify any general alteration of method and in the spring of 1961 the biggest programme of research into the pilchard and its fishery commenced. A committee had been formed upon which the White Fish Authority, the Ministry of Agriculture, Fisheries and Food, the Cornwall Sea Fisheries Committee, the canners and the fishermen were represented. Funds were made available to charter, equip and operate a larger vessel for about two years. The organisation was to be called the Pilchard Development Unit and its objects were to locate the pilchard shoals throughout the year and to find the most efficient method of catching pilchards regularly.

A 65 ft. vessel was chartered and she was equipped with numerous aids, such as Decca Navigator and echo sounding and ranging equipment. Several types of fishing gear were used; these included drift nets, midwater and bottom trawls and purse seines. The project continued until January 1963 but met with little success and it was concluded that, in summer, drifting was the only successful method open to small boats of moderate power. Use of the more active methods

* Cornwall Sea Fisheries Committee sanctioned the use by Shippams of these small mesh nets for one year in order that the trials might be carried out (Fishing News No. 2316 -6th September, 1957). A further extension of twelve months was granted (Fishing News No. 2369 - 12th September, 1958).

such as seining and trawling was not aided by the loosely packed nature of the summer shoals or the phosphorescence in the water which clearly illuminated the moving net. The wintering grounds of the fish were not located, and so in order to search a wider area two follow-up visits were paid to the area in March 1964 and November-December 1964 by one of the larger research vessels of the Ministry of Agriculture, Fisheries and Food. Some pilchards were caught by mid-water trawl but again the work was hampered by the weather and the results were inconclusive. It was felt, however, that in order to have any chance of success in winter, the vessels used must be capable of working in the open Atlantic 60-100 miles from port. Unfortunately, in rough weather, the shoals break up and midwater-trawls, ring nets and purse-seines become almost totally ineffective and the driftnet remains as the only feasible catching instrument. The incidence of such conditions is high in winter and consequently it is unlikely that vessels of 100-200 ft. in length, which would be the only type capable of consistently prosecuting the fishery in this season, could operate profitably in these conditions.*

The final outcome of these trials was, in fact, no different from that of earlier experiments, and drifting continues as virtually the only method of fishing in this declining industry.

* Most of the information concerning the Pilchard Development Unit and its follow-up has been synthesised from a personal communication of 25th March 1965 from J.P. Bridger, who was one of the two Ministry of Agriculture, Fisheries and Food scientists engaged upon the work.

(b) Sprats

The principal methods of catching sprats have undergone a complete change during the period and although since the winter of 1946-47 most sprats have been caught by trawl the type of gear used has altered considerably. During the winters of 1944-45 and 1945-46 experiments were conducted in Devon and Cornish waters by fishermen mainly from Brixham in collaboration with others from Belgium³⁸ to determine the usefulness of a small mesh sprat trawl which was towed fairly fast through the water. The trials were successful, but commercial exploitation could not be commenced immediately for, in order to protect immature fish of other species, Cornish and Devonshire by-laws prohibited the use of such small mesh nets. There was sufficient evidence from the trials carried out at Brixham early in 1946, however, to convince the Devon Sea Fisheries Committee that the harmful effects of such a fishery would be small and in that year a by-law was passed which permitted trawling for sprats between 30th September and 1st February with a small mesh net.³⁹

The trawl used was a type of otter-trawl and, prior to its introduction in Torbay, a form of seine net (Fig. 13) was employed and, indeed, its use continued for several years after the introduction of the trawl. While the trawl was obviously the more effective of the two fishing instruments, its use served in another way to cause the demise of the seine: the trawlers, while fishing, dispersed the shoals of sprats thus often making it impracticable for the seiners to shoot their nets.¹² They had several poor

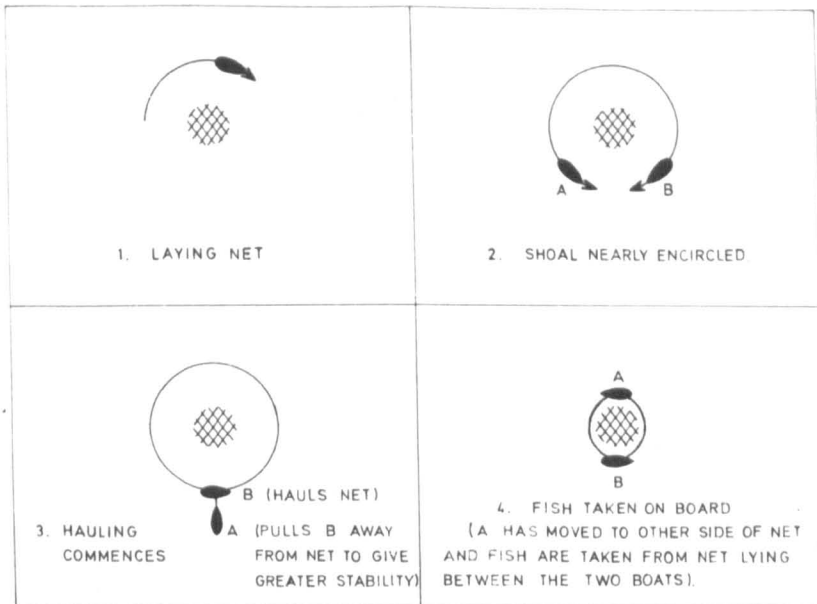


FIG 12 Ring-net Fishing.

A MORE DETAILED DESCRIPTION OF THE METHOD IS GIVEN IN "THE EXPERIMENTS IN THE CORNISH PILCHARD FISHERY IN 1947-8," W.C. HODGSON AND I.D. RICHARDSON, H.M.S.O., 1949.

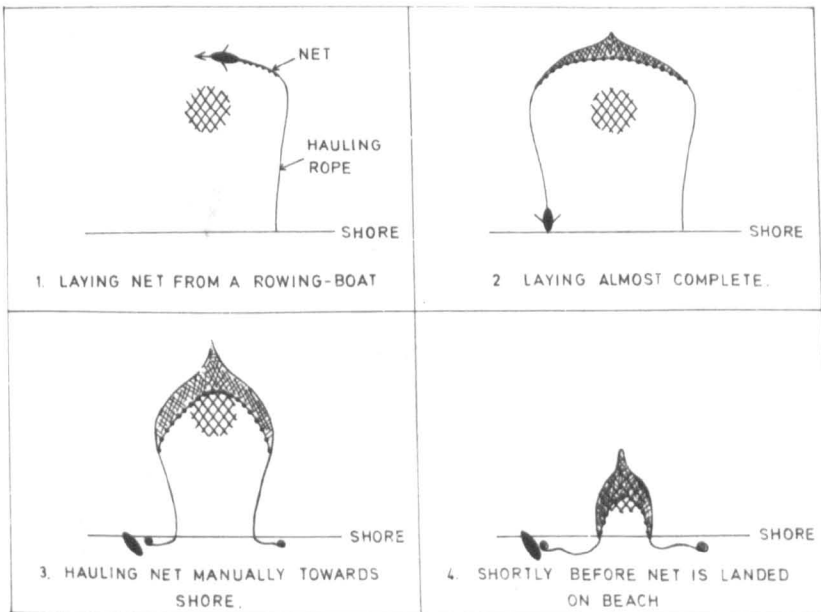


FIG 13 The Shooting and hauling of a Shore-seine.

SIMILAR NETS ARE SOMETIMES FISHED FROM A SECOND BOAT INSTEAD OF FROM THE SHORE; THE METHOD OF OPERATION IS SIMILAR TO THAT FOR A RING-NET.

seasons and in 1951 the by-law was altered to delay the start and extend the finish of the sprat-trawling season by one month.⁴⁰ From the 1953/54 season fishing was allowed to continue until 31st March each year.⁴¹ This enabled seiners to make fair catches before the trawlers scattered the fish.¹² Between 1952⁴² and 1965 the by-laws of the Cornwall Sea Fisheries Committee permitted commercial sprat-trawling in local waters and it was sometimes conducted on a small scale from Looe.^{12 43}

At Poole otter-trawling had been practised throughout the post-war period until the winter of 1963-64, although the proportion of sprats caught by this method has been decreasing since about 1955. An older method of trawling for sprats, which was unique to Poole and was still being carried out in the early years after the war, used a beam-trawl with the beam raised some 3 ft. to 4 ft. above the trawl heads on iron stanchions.⁶ It appears that this method of fishing finally went out of existence in the second half of the 1950's.* Seining was also carried out here at least until the winter 1953-54.⁴⁴

Sprats are still caught by beach seine along the Chesil Beach and at West Bay and the appearance of large shoals in the area within catchable distance of the shore on many occasions since 1959 has probably had much to do with the retention of the method.

The most important development in the sprat fishery has been the introduction of the pair-trawl, an instrument which is towed between two vessels in mid-water or near the

* Personal communication dated 29th October, 1956 from the District Inspector of Fisheries for the South-Eastern area for the Ministry of Agriculture, Fisheries and Food stated that "the use of the beam trawl (for catching sprats) is not entirely dead...."

sea-bed. The depth at which the trawl is fished varies and may be determined by the density of fish at different levels, as shown up on echo-sounding equipment carried in one or both vessels.

The inventor of this type of trawl, Robert Larsen, a Dane, had been experimenting for thirteen years⁴⁵ before it was being mass-produced in Sweden in 1949.⁴⁶ It was originally intended for catching herring⁴⁵ but was adapted for sprat fishing and used in the Thames Estuary in 1950 at Southend¹⁸ and formed the basis of the new Whitstable sprat fishery. The success of the method caused its use to extend particularly to Poole and Weymouth and the Torbay and Teignmouth areas. The Larsen trawl was first used at Poole and in the Torbay area in about 1954,^{47 48} but it was not until the winter of 1963-64 that all sprats landed at Poole were caught by pair trawlers.⁴⁹ In Torbay sprats are caught by pair trawlers early in the season, but later when the fish spend more time near the sea-bed, below the operational level of the nets used by these vessels, the fleet converts to single-boat otter trawling. In 1963, two vessels experimented with single vessel mid-water trawls using floating trawl boards.⁵⁰

The vessels engaged in sprat trawling vary in size between about 25 ft. and 50 ft. Some of the Whitstable vessels have been designed and built specifically for this fishery and are about 36 ft. in length. They have the wheelhouse forward, and the after part of the vessel, with removable wooden covers, is used as a fish hold. The remainder of the pair-trawlers at Whitstable and most of those at the other ports are vessels primarily built for

some other form of fishing (e.g. trawling for demersal fish) and converted in the season for spratting. In recent years one Whitstable vessel has been operating quite successfully with a "single-boat" Larsen-type trawl, the mouth being held open horizontally by a beam and vertically by weights.⁵¹

In marked contrast to the more modern, dynamic methods, one interesting "relic" form of sprat fishing persists on the south coast of Kent and the Sussex coast. Here, small quantities of good quality fish are landed, mainly in the early part of each winter, by little vessels fishing with drift nets (Plate 10).

(c) Mackerel

These fish have been caught by two principal types of vessel; the large herring drifters, which have travelled round from the east coast after the close of the herring season and have used Newlyn as their base each spring while fishing in the Atlantic, up to about 200 miles from the port,* and smaller local inshore vessels of all sizes down to about 12 ft. in length, from which the fish may be caught with lines, drift nets or seine nets.

Seine nets are suitable if shoals are tightly packed and close to the shore and fish have been caught by such instruments over a wide area but in small quantities throughout the period. They have, however, been declining in importance for the following reasons:-

* It is mentioned in the Quarterly Report of the Fisheries Officer for the Cornwall Sea Fisheries Committee of 12th May 1956 that the vessels were fishing up to 180 miles from Seven Stones.

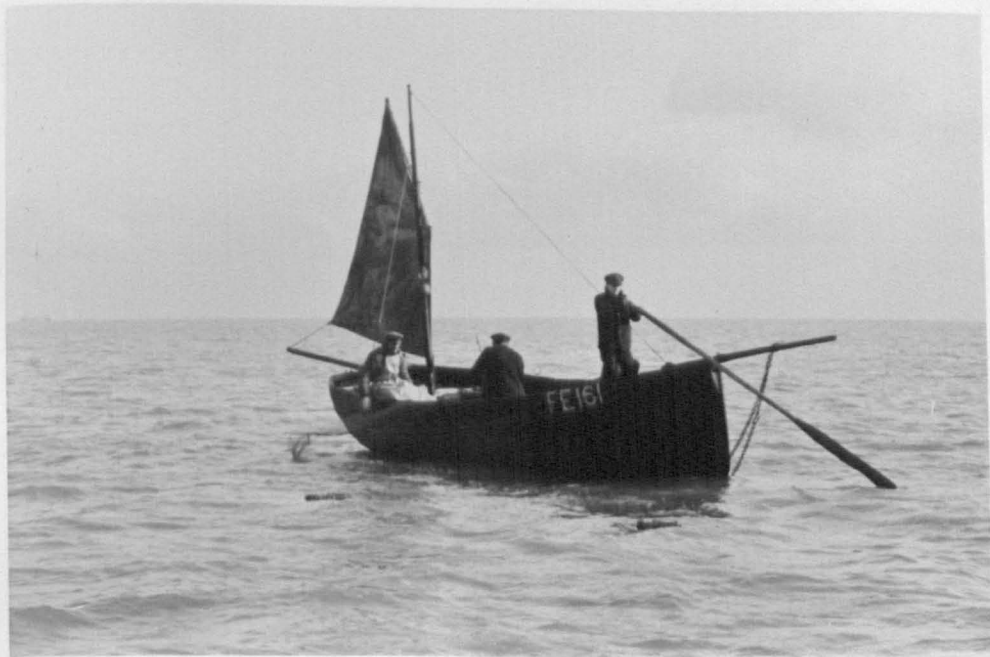


Plate 10 Dungeness herring or sprat drifter.
The net is being let out from the boat and two
cork floats attached to the headline are between
the boat and the camera.

- (i) A minimum of about eight persons is required to haul any but the smallest seines.
- (ii) Considerable periods are often spent waiting for the fish to get into a suitable position.
- (iii) Catches are very variable.
- (iv) The equipment is expensive.

Mackerel have also been caught in drift nets by local vessels, the largest of which have fished from St. Ives and in some years have prosecuted the Atlantic fishery with the Lowestoft and Yarmouth boats. Other and smaller drifters have fished from Newhaven and other centres at the eastern end of the Channel. This method has also been of decreasing importance owing to the cost of the necessary gear and its limited use; the size of meshes required make it unsuitable for catching in quantity any other types of fish which are common in the region. One final factor which has assisted the demise of this type of fishing has been the success of line-fishing.

While line-fishing for demersal fish is in general a passive form of operating, this is in no way the case when mackerel form the object of the fishery. "Trailing" is a method which is advantageous if the fish are scattered over a wide area and consists of towing weighted lines, with baited hooks attached, over areas where mackerel are known to be. Up to about ten lines may be towed by any one vessel and they are often kept clear of the boat by outriggers. There are records of "trailing" in Cornish waters both before⁵² and shortly after^{53 54} the war and the author has

knowledge of its practice off Portsmouth but the method has by no means been restricted to these areas. The second system, which has become commercially the most important is employed when the fish are in fairly dense shoals not too far from the coast. A boat is stopped over a shoal and weighted lines, usually with between about seven and thirty hooks attached, are lowered into the shoal and then pulled into the boat, often with a fish on every hook. The bait used is similar to that employed in the other methods of fishing and may be feathers, shiny metal or silver paper, parchment, fish skin or some other shiny or light coloured substance which would attract the attention of the fish. Feathers, which will withstand considerable wear and obviously are very attractive to the fish, have been used to a large extent in recent years, although the method has probably been in use throughout the post-war period.*

The increase in the quantity of mackerel caught in inshore waters (Table 23) since 1960 has been based entirely on line fishing employing this form of bait.

* Frampton mentioned in 1954 in his unpublished paper "The Fisheries of Devon and Cornwall" that "feathering" as this form of fishing is called had been operated for the past six or seven years.

♣ The Chief Fishery Officer for the Kent Sea Fisheries Committee suggested that "feathering", using 15 hooks, was introduced off Kentish coasts from Scotland in 1945.

TABLE 23

Approximate quantity (cwt) of mackerel landed
in the region by inshore vessels (British)
between 1950 and 1965

1950	5,600	1958	12,000	<u>Source:</u> Derived from Sea Fisheries Statistical Tables.
1951	8,500	1959	13,300	
1952	6,300	1960	14,300	
1953	10,100	1961	19,500	
1954	9,200	1962	20,600	
1955	13,300	1963	29,100	
1956	9,400	1964	31,700	
1957	14,400	1965	26,000	

The obvious advantage of line fishing for mackerel over the drift net fishery for small inshore vessels is that the type of gear used is very much cheaper in initial purchase and in replacement. Other advantages are that the problem of, and time taken for, preparation, care and storage of nets are avoided, a smaller vessel can be used and the operation of the method is considerably simpler. It is doubtful whether the line-fishing method is more efficient from a catching point of view or whether it requires less effort from the fishermen, but the overwhelming advantages of cheapness and of simplicity of operation make it very attractive.

Drift fishing for mackerel from Newlyn by east coast vessels declined in importance after 1954 and since 1957 between one and four of these vessels visited the western waters compared with eleven to fourteen during the period 1949 to 1954, following the post-war re-establishment of the fishery in 1948 when eight vessels were operating. The end of the fishery was probably witnessed in the 1967 season as the only vessel that had journeyed from Lowestoft made

very poor catches indeed.

This reduction may be attributed to several factors, not least of which is the overall decline in the number of such vessels in existence. This, in turn, has been associated with the diminishing importance of the North Sea herring fishery. Prior to 1955 most of the landings were made by coal-burning steam-driven vessels (Table 24), which were generally old and uneconomic to operate, but they were not helped by the high price of coal at Newlyn⁵⁵ and none fished from the port after 1957. An additional handicap has been the high cost of gear, which has been felt particularly acutely as the drift nets used for mackerel are not suitable for catching herring owing to the different size of mesh required, and a further set of nets is therefore required in order to take part in the Cornish fishery; it has been suggested⁵⁶ that the slow rate of recovery of the fishery after the war was in part due to the difficulty in getting gear. The economic susceptibility of the operations is indicated by the halving of the number of visiting vessels between 1956 and 1957 following the poor catches of 1956; although the catches per season per vessel did not subsequently reach such a low level until 1963, no more than four vessels have taken part in the fishery.

The decline of mackerel drifting combined with the increasing importance of the line fishery was such that, while in the years 1950-1955 virtually all the mackerel landed at Newlyn were caught by large drifters, by 1961 only about half of the landings were made by these vessels. By 1964, the figure was reduced to about one-twelfth. The decline was absolute as well as relative (Table 24).

Table 24 also shows the decline in the proportion of landings made by steam drifters, until by 1958 the only catches of mackerel by this type of vessel in any of the areas "English Channel", "Bristol Channel" and "South of Ireland" were made by drifters fishing for herrings in these waters from ports outside the region. Up to 1958 (with the exception of 1956) there was an increase in landings made by the large motor drifters, but the peak of that year has not subsequently been equalled.

TABLE 24

Details of Mackerel Landings (cwt) by
British Vessels: 1946-1964

<u>Numbers of East Coast Drifters Fishing from</u>		<u>Mackerel caught by drifters in English Channel, Bristol Channel and South of Ireland by vessels greater than 40 ft. in length. Most of these fish are landed at Newlyn and the remainder have been brought ashore at St. Ives by local drifters.</u>			<u>Mackerel landings at Newlyn</u>
<u>Year</u>	<u>Newlyn</u>	<u>By Steam Drifter</u>	<u>By Motor Drifter</u>	<u>Total</u>	
1946	-	-	525	525	(Figures not available in S.F.S.T.
1947	-	-	143	143	
1948	8	9,192	1,690	10,882	
1949	13	11,725	1,022	12,747	
1950	14	13,054	182	13,236	13,028
1951	11	20,398	12	20,410	20,383
1952	12	16,945	731	17,676	18,152
1953	14	18,183	1,454	19,637	20,736
1954	14	16,623	2,680	19,303	19,383
1955	6	9,486	4,594	14,070	14,254
1956	8	1,347	2,796	4,143	5,129
1957	4	2,269	5,723	7,989	9,655
1958	3	3	8,954	8,957	10,611
1959	3	14	7,249	7,249	8,192
1960	2	-	2,864	2,864	4,658
1961	3	-	6,027	6,027	11,088
1962	3	-	6,656	6,656	12,252
1963	4	-	1,852	1,852	12,126
1964	4	-	1,021	1,021	12,450

Source: Sea Fisheries Statistical Tables.

Numbers of drifters from Reports of Cornwall Sea Fisheries Officer.

(d) Herring

Herring have not been caught in quantity by the inshore vessels of Southern England at any time in the period, although considerable landings have sometimes been made at Dover by large drifters from the east coast ports. These vessels fish off the north French coast when the East Anglian herring season is completed and land their fish at Dover, because of its convenient nearness to the fishing grounds. The local fishery has been conducted mainly from the south coast of Kent and Sussex and the north coast of Cornwall.

Drift fishing has been the principal commercially important method of catching herrings from southern England since the second world war. The equipment used by the east coast vessels has been considerably larger than that employed by the smaller inshore boats, but the method of operation has nevertheless been the same. The local drifters from Kent and Sussex spend the remainder of the year trawling or fishing for mackerel, while those from the north coast of Cornwall engage mainly in line fishing and trawling or move round to the south Cornish coast for pilchard drifting.

Herrings have also been caught off the West Sussex coast in set nets.⁵⁷ These are similar to small drift nets but are moored instead of being attached to a drifting vessel.

Finally, mention may be made of the annual winter fishery at Dunmore East in which some larger Cornish vessels have taken part in the past and used drift-nets⁵⁸ and ring-nets. The last visit occurred in November 1965 and none has subsequently been made because of the difficulties experienced with the revised fishery limits.

3. Shellfish

Except for line fishing, which accounts for a relatively small proportion of the value of wet fish landed, the catching of wet fish is essentially active. Shellfishing, on the other hand, with the principal exceptions of oyster and scallop dredging and, in recent years, free diving for crawfish, makes use of methods which are mainly passive, the prey being enticed into a baited trap.

Shellfish of many types are caught by a considerable variety of methods, most of which are relatively simple, both in construction and in method of operation. Short-handled rakes are often used for obtaining cockles and butterfish, in some places nets fixed to triangular or semi-circular frames which have handles attached are pushed through shallow water to catch shrimps and prawns, while baited ones on circular frames each with a rope attached for hauling and lowering are used for the same purpose and fished from the sides of piers, harbour walls, breakwaters and other suitable places. Methods similar to these have remained unchanged throughout the period but they have been of little but local significance. Systems used for catching shellfish of greater economic importance are also simple but operated on a larger scale; it is these which will now be considered.

Lobsters, crawfish and crabs are traditionally caught in pots which are almost hemispherical in shape, with the entrance at the top (Plate 4). This entrance has the form of an inverted frustum of a hollow cone and acts as a non-return valve. These "inkwell" shaped "Cornish" type pots, which are used at many places all along the coast,

have long been made of withies by the fishermen themselves during the non-fishing part of the year but for some time their numbers have been declining, partly because of the increasing use of other types of pots which are easier to construct and partly because of the seasonal nature of the availability of these withies, many of which are brought from Somerset. One final, but very important factor, has been the increase in the price of osiers and the freight rates to bring them to the coast; these rises have become very considerable in the last few years. There has been a growing tendency for fishermen to have their pots constructed of wire and wood and sometimes covered with netting (Plate 11) but still made in the same shape. Although these wire pots are dearer than those made of withies and are harder for old men to construct, they have the advantages of being less vulnerable to damage by ground swell⁵⁹ and their manufacture need not be seasonal. Metal traps have been employed in the south-west for at least twelve years and recently their numbers have increased considerably but they have not become popular in the south-east. There are several possible alternative or cumulative reasons why the use of the wire pot has not become more widespread.

(a) Loss of pots through adverse weather conditions is not so great in the south-east as in the south-west so there is a smaller requirement for a more expensive but less vulnerable instrument.

(b) Shellfishing is on a smaller scale and more widely spread in the south-east, and dissemination of information concerning such instruments is therefore more difficult. Nevertheless, other types of traps than those traditionally used are employed in the south-east.



Plate 11 Lobster pot of traditional shape but made of wire and wood and covered with netting (about 2 ft. 6 ins in diameter).

(c) Although figures are difficult to obtain to confirm this, there are possibly more relatively prosperous fishermen in the south-west who are able to afford to try new and more expensive types of fishing gear.

A second type of pot which has been widely used during the post-war period at the expense of the withy trap is the "French" type cylindrical pot. It is constructed of building laths or similar wooden strips and covered with net at both ends; there may be one or two "non-return" conical shaped entrances in each instrument (Plate 5).

It is cheaper to construct than those of withy or of metal and it can be made at any time. It is less robust than the other types but one of the principal reasons for its widespread adoption has been the suitability of its shape for storage, particularly on a boat's deck (Plate 12): one of the larger Cornish vessels can carry all its fleet of 150 to 180 pots in a single load to move from one fishing ground to another.⁵⁹

Other types of wooden pots which, except for their entrances, are almost entirely covered in netting, have also become very popular. They are made in a considerable variety of shapes and sizes but those with a rectangular or almost semi-circular cross section have proved popular. (Plate 13). Like the "French" type, they are cheaper than the withy pots and also relatively economic in storage space on a boat.

The relative merits in methods of construction and cost of the various types of traps may be easily determined but their fishing qualities are less simply assessed and open to much doubt. For example, metal, net covered, "Cornish" type traps are used by Browse Bros. Ltd. at Paignton and

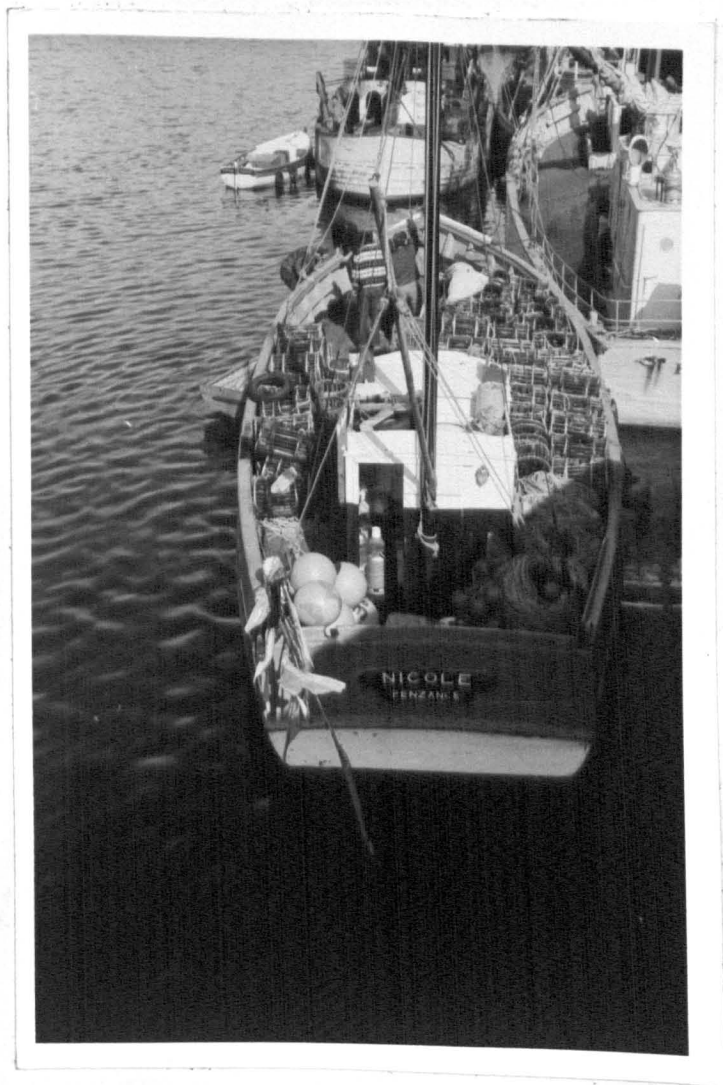


Plate 12 Storage of pots on the
deck of a larger shellfishing craft.

and on vessels fishing for the organisation, although Porthleven Fisheries use approximately 50% willow pots and 50% "French" type pots; the proportion of the latter type has increased from virtually nothing in 1963 but it is felt within the organisation that, despite the advantages of these instruments, their tendency to instability on the sea-bed may be causing damage to lobsters.

As it is often necessary to stow large numbers of pots in vessels, it is surprising that collapsible traps or those which fit into each other for stowing have not caused a greater impact in the region. Although time would be taken while the pots were assembled, a considerably greater number could be carried than of the traditional types. Providing the basic design suits the area, collapsible pots fish as well as other types, but only in Broadstairs is a type of folding trap accepted by one fisherman as normal rather than new.⁶¹ This pot, which is rectangular in shape, net covered and with hinges at both ends, has been in use for about 20 years.⁶²

Methods of fishing with pots have changed little during the period. The traps are set in suitable areas, where they remain for a period which is usually 24 hours. They are then taken up, any catch is removed and the bait renewed, and the traps are returned to the water, perhaps after being moved to another area. The pots are fished either singly or in fleets. If they are set singly a buoy is attached to each pot but if in fleets, each end of a fleet is buoyed, and there may be several buoys along the length of the fleet. Fishermen with a large number of pots usually prefer to set them in fleets as it is easier to keep track of the pots,

the possibility of loss in rough weather is reduced and less movement of the vessel is involved in hauling and setting as the vessel does not have to be restarted and moved to each pot in turn. Fishing the pots individually means that a wider area can be covered and if losses due to bad weather do occur, it is unlikely that all pots would be lost.

The number of pots in a fleet may be limited by the area of ground which is to be covered or by the number of pots which can be handled on the deck of a vessel when they are being hauled and shot, for at one time during these operations the whole fleet is inboard. In a small vessel the total fleet, particularly if "Cornish" type pots are used, may be limited to eight or ten pots (Plate 14).

A larger vessel, such as the 60 ft. "Concord", a former Scottish seiner which was owned between 1962 and 1965 by Browse Bros. Ltd. of Paignton, might fish as many as 500 pots⁶³ in fleets consisting of between 40 and 50 pots.¹⁴

A method of fishing for crawfish which has developed with considerable success particularly since about 1960 has been free diving. This has been practised professionally on any significant scale only in Cornwall, where the first recorded attempt at skin-diving specifically for crawfish was made in 1957 in the Runnelstone area by an amateur. At about the same time several divers from Mousehole were catching and processing sea-urchins for visitors. By 1960 several people were doing this on a full-time basis and by 1961 a few were known to be fishing for crawfish. In 1963 three divers were spending most of their time fishing for



Plate 13 Variety of shellfish pots at Weymouth.



Plate 14 Cramped working conditions on a small shellfishing boat when hauling and setting pots. The pulley behind the fisherman is driven from the engine and used for hauling the pots.

crawfish and the remainder were increasing the proportion of time in this occupation at the expense of harvesting sea-urchins; one individual was engaged upon both diving and potting and used the method most suited to the conditions prevailing at any one time.

By the end of 1963 four or five divers had their own boats equipped with echo-sounders and spent their time diving for crawfish on neap tides and feathering for mackerel or catching sea-urchins inshore in Mount's Bay on spring tides. Between 1963 and 1964 expansion was considerable, for the sea-urchin trade was slacker and diving techniques had been improved to allow more days to be worked in each tidal cycle; there were now fourteen fishermen working full-time in this way and the main restrictions were only adverse weather conditions and a limit on the depth to which diving could be carried out of about 100 feet.

In the early stages, the crawfish collected were put into pots but it was found that up to about 50% escaped. This indicated that the pots were of bad design and a skewer was put across the mouth of each pot. The whole method was, however, both time wasting and restricting and the fishermen had to keep returning to their pots; consequently, net bags, which were carried around, came into use.

Skin-diving is a method particularly well suited to catching crawfish. These creatures may be quite easily picked up from rocky areas but lobsters are not caught in large quantities by the divers because of the difficulty experienced in removing them from holes.*

* Most of the information concerning skin-diving was provided by a former Chief Fishery Officer to the Cornwall Sea Fisheries Committee. July 1965.

Naturally there has been antagonism between the divers and the shell fishermen using more traditional methods. This situation has probably not been helped by the action of the Cornwall Sea Fisheries Committee in actively encouraging the development of skin-diving among bona fide fishermen; the the Fishery Officer who provided the above information and was, himself, a keen diver, was probably a major force in this promotion. Many fishermen have been critical of the action of the Cornwall Sea Fisheries Committee.^{64 65}

There has been a tendency among some shellfishermen in the south-west to purchase larger boats. The fishery off the north Cornish coast has expanded considerably in the 1960's and at Newquay, 40 ft. vessels were brought into service in 1962⁶⁶ and 1963⁶⁷ and in 1966 a 33-ton (49 ft. in length) French crabber was acquired.⁶⁸ At St. Ives one boat was shell fishing in 1960 but by 1963 the number had increased to 16, and included three vessels over 40 ft. in length.

The larger vessels have an increased range and can operate in a wide variety of weather conditions but perhaps the principal benefit from their use lies in the greater number of pots which can be carried and fished, thereby enabling their potential catch to exceed that of the smaller boats. Admittedly some such craft have been turned over to shellfishing because of the decline in pilchard drifting and line fishing, but this should not detract from their real advantages or from the positive policy on the part of some fishermen to operate vessels of over 40 ft. in length when catching crabs, lobsters and crawfish.

The organisation of Browse Bros. Ltd. was the first in the region to attempt crab-fishing on anything but a very small scale. When the Paignton processing plant was opened

in 1954, the proprietor had already been a crab fisherman for many years and four vessels were operated by the firm. The number never exceeded five but the boats were generally relatively large compared with others put to similar uses and early in 1962,⁶³ the "Concord" was purchased in an attempt to catch crabs in deep water in the Channel. The vessel was fitted with a Decca Navigator system and the 500 pots which were worked from it compared favourably with the 200 of each of the other three vessels owned at that time by the firm.⁶⁹ The venture was not a success, at least partly because Brixham and foreign trawlers were operating in these deeper waters where pots were laid. There is also evidence that friction occurred in Plymouth, from which the vessel was fishing in the spring of 1964,⁷⁰ between its crew and those of other boats.⁷¹

The experience with this vessel was not encouraging but the firm was finding other difficulties which were affecting its entire shell fishing and marketing activities. Perhaps the most important was the loss of two outlets for its products, but the fishery itself has not been free of problems and some crab grounds, particularly in the vicinity of wrecks, have become more restricted as it became possible for trawlers, with the aid of Decca Navigator equipment to fish right up to and around obstacles whereas formerly potters could put their equipment in these general areas knowing that trawler fishermen would not risk losing valuable equipment by fishing there.

Browse became fairly sure that the future lay mainly in trawling, particularly as crab prices were at a relatively low level following good catches. By the end of 1964 he equipped the "Concord" for this form of fishing. It was to

work from Plymouth, and another 60 ft. vessel, the "Juneve", which he had bought earlier that year, was to trawl from Newlyn.⁷² Success evaded these operations, owing partly to crew difficulties and partly to the problems inherent in basing the vessels at ports distant from the centre of the organisation. Repairs presented difficulties and when undertaken were sometimes protracted, perhaps because of lack of supervision from Paignton. The loss of fishing time was often considerable and by July 1965 both boats were sold, once again to fish from Scottish ports. Browse was now left with two crab boats and during 1966 he purchased a new 50 ft. general purpose vessel which was built in Mevagissey⁷³ but by early 1967 he had sold all but one boat, which was skippered by his son, largely because of the difficulties which he was experiencing with his crews. In addition to the crabs landed by his son, he was buying shellfish for processing from fishermen at Dartmouth and Salcombe and was making pots for their use.

Porthleven Fisheries, Ltd., the other integrated shellfishing concern in the region has not attempted to diversify into other forms of fishing but has also been reducing its fishing activity and buying more shellfish from other fishermen. This organisation, too, has used some larger boats and although its first vessel, launched in September 1961, was relatively small, being 27 ft. in length, by July 1965 it was operating four additional boats, two being 30 ft. in length, one 37 ft. and one 42 ft. All but the largest of these boats is still owned by the firm.

The pair of 30 ft. vessels is unusual. They are fast, being capable of 14-15 knots⁷⁴ and it was intended that they should be able to fish more distant grounds. Their design is also unique in other respects (Plate 15); the wheelhouse in each is situated forward in order that pots can be carried and dealt with in the large area aft. Also, the pot hauling procedure is facilitated by a davit which enables the pots to be kept clear of the side. In other vessels, the pots are usually mechanically handled to the surface and then manhandled on board over the side. One of these fast crabbers is proving to be extremely successful under her present skipper (in the autumn of 1967)⁷⁵ but for some time the value of the craft was open to doubt; they proved themselves to be less seaworthy and more expensive to operate than the more traditional types, and instead of working more distant grounds, they were often used to exploit the same areas as the slower vessels. Consequently, one of the principal advantages of their speed was to get the fishermen ashore earlier after their work.

The remaining relatively important form of shellfishing is that for oysters. Generally they have been brought up for intermediate inspection and final capture in dredges which are about 2 ft. wide. Several of these are towed behind each vessel and the method has been in operation for many years.

In 1960 and for a few years after, Oyster Fishermen (Poole), Ltd. experimented by laying some on the harbour bed in Courlene (an artificial fibre) net bags. Each bag contained about 100 fish and some 30 such bags were attached

to a trip line, the end of which was buoyed and could therefore easily be hauled up for inspection.⁶⁰ Unfortunately the experiments were not successful as the lower oysters in the bags tended to be smothered. The failure of these trials was all the more unfortunate because in them lay the hope of simplifying the fishing procedures and generally controlling the layings more carefully.

Escallops have also mainly been caught in dredges, similar to but much larger than those used for oysters; their width is usually of the order of 5 ft.-6 ft. (Plate 16). In recent years, the more efficient Baird Sledge dredge has come increasingly into use;* it incorporates a diving plate to keep it on the sea-bed and sledge-type runners to enable it to move smoothly along the bottom. Other methods include using a small conventional trawl equipped with a heavily chained footrope, when heavy seas have lifted the escallops from depressions in the sea-bed; Brixham fishermen use this system and some have been skin-diving for the fish on a bed just outside the local breakwater.

* Full details of the Baird Sledge Dredge may be obtained from Ministry of Agriculture, Fisheries and Food Laboratory Leaflet (New Series) No. 5. Fisheries Laboratory. Burnham-on-Crouch. February 1965.



Plate 15 Two fast Porthleven shellfishing boats.

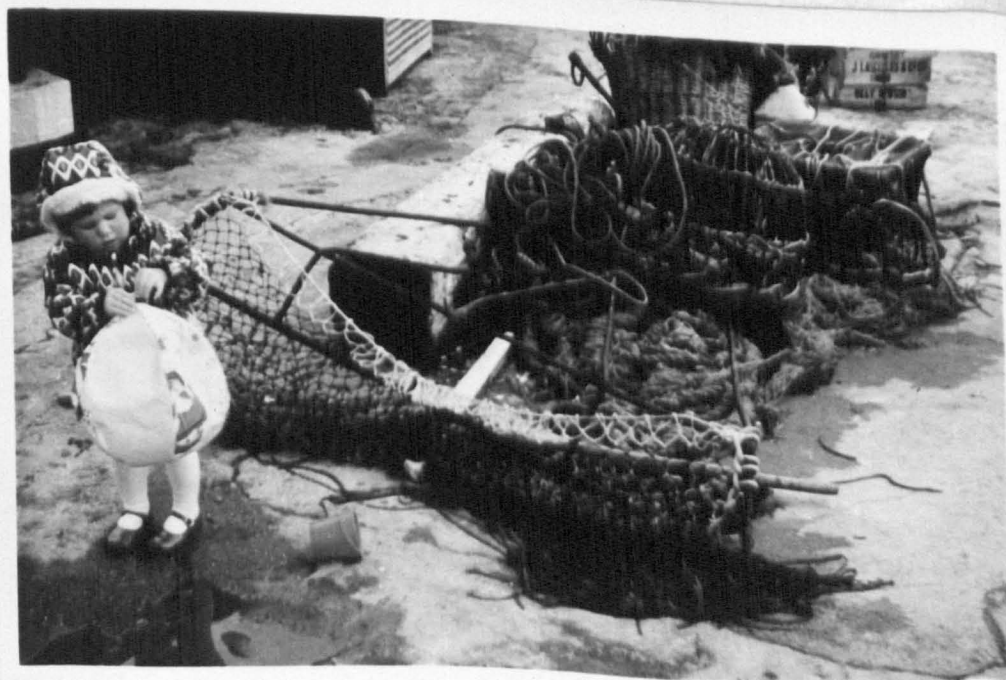


Plate 16 Escallop dredge (at Lyme Regis).

1. Principal Methods of Fishing, Fishing Grounds and Seasons. Leaflet No. L.4. Ministry of Agriculture, Fisheries and Food and Department of Agriculture and Fisheries for Scotland. Date not known.
2. Fishing News No. 2763. 20th May, 1966.
3. Report of Sea Fishery Officer for Cornwall Sea Fisheries Committee for period ending 5th March, 1947.
4. Report of the Fishery Officer, Cornwall Sea Fisheries District for the period 24th October, 1963 to 27th January, 1964.
5. Fishing News No. 2555. 25th May, 1962.
6. M.Sc. Thesis 1957. University of London. T.D. Kennea.
7. Fishing News No. 2190. 7th April, 1955.
8. Fishing News No. 2221. 11th November, 1955.
9. Fishing News No. 1984. 28th April, 1951.
10. Fishing News No. 1987. 17th May, 1951.
11. Fishing News No. 2009. 20th October, 1951.
12. The Fisheries of Devon and Cornwall. R.H.C.F. Frampton. Unpublished. Ministry of Agriculture, Fisheries and Food, 1954.
13. Quarterly Report of the Fishery Officer for Cornwall Sea Fisheries Committee for period ending 16th August, 1962.
14. Fishing News No. 2560. 29th June, 1962.
15. Quarterly Report of Fishery Officer for Devon Sea Fisheries Committee for period ending 24th May, 1963.
16. Article - Atticus. The Sunday Times. 29th November, 1964.

17. Personal communication from H.M. Boniface, Esq., 18th October, 1967.
18. Fishing News No. 1960. 11th November, 1950.
19. Quarterly Report of Fishery Officer for Cornwall Sea Fisheries District for period ending 6th June, 1945.
20. Report of Fishery Officer for Cornwall Sea Fisheries District for period ending 19th September, 1945.
21. Report of Fishery Officer for Cornwall Sea Fisheries District for period ending in February, 1946.
22. Report of Fishery Officer for Cornwall Sea Fisheries District for period ending 22nd May, 1946.
23. Report of Fishery Officer for Cornwall Sea Fisheries District for period ending 13th June, 1947.
24. Fishing News No. 1839. 10th July, 1948.
25. The Experiments on the Cornish Pilchard Fishery in 1947-48. William C. Hodgson and Ian D. Richardson. H.M.S.O. 1949.
26. Report of the Sea Fishery Officer of the Cornwall Sea Fisheries Committee for the period ending 22nd November 1952.
27. Fishing News No. 2382. 12th December, 1958.
28. Personal communication. J.P. Bridger. 26th March, 1964.
29. Report of the Sea Fishery Officer for Cornwall Sea Fisheries Committee for period ending 6th December, 1951.
30. Sea Fishing Industry of England and Wales. F.G. Aflalo. Stanford 1904.
31. Quarterly Report of the Sea Fishery Officer for Cornwall Sea Fisheries Committee for the period ending 20th November, 1947.

32. Quarterly Report of the Sea Fishery Officer for Cornwall Sea Fisheries Committee for period ending 14th November, 1950.
33. Quarterly Report of the Sea Fishery Officer for Cornwall Sea Fisheries Committee for period ending 29th May, 1952.
34. Fishing News No. 2108. 5th September, 1953.
35. Report at sub-committee meeting of Cornwall Sea Fisheries Committee. 30th July, 1952.
36. World Fishing. September 1958.
37. Fishing News No. 2219. 28th October, 1955.
38. Fishing News No. 1669. 17th March, 1945.
39. Fishing News No. 1743. 24th August, 1946.
40. Report of the Annual Meeting of the Devon Sea Fisheries Committee 27th June, 1951.
41. Personal Communication from A. Sharples (White Fish Authority). 21st September, 1967.
42. Fishing News No. 2056. 13th September, 1952.
43. Quarterly Report of the Sea Fisheries Officer for the Devon Sea Fisheries Committee for the period ending 12th February, 1953.
44. Fishing News No. 2126. 15th January, 1954.
45. Fishing News No. 1868. 29th January, 1949.
46. Fishing News No. 1869. 5th February, 1949.
47. Fishing News No. 2387. 16th January, 1959.
48. Quarterly Report of the Sea Fisheries Officer for the Devon Sea Fisheries Committee for the period ending 30th November, 1954.

49. Fishing News No. 2126. 15th January, 1964.
50. Quarterly Report of Sea Fisheries Officer for Devon Sea Fisheries District for period ending 22nd November, 1963.
51. World Fishing. March, 1962.
52. Notes on Cornish Fisheries. W.H. Barron. Cornish Sea Fisheries Committee. 1933.
53. Quarterly Report of the Fisheries Officer for the Cornwall Sea Fisheries Committee. 16th February, 1949.
54. Quarterly Report of the Fisheries Officer for the Cornwall Sea Fisheries Committee. 20th August, 1951.
55. Fishing News No. 1776. 28th April, 1947.
56. Fishing News No. 1872. 22nd February, 1949.
57. The Fisheries of the Sussex Coast. Ministry of Agriculture, Fisheries and Food. Unpublished. Date unknown.
58. Quarterly Report of Fishery Officer for Cornwall Sea Fisheries Committee for period ending 14th November 1958.
59. Letter from the Chief Fishery Officer of the Cornwall Sea Fisheries Committee to T.D. Kennea, 26th February, 1964.
60. Report of Fisheries Organisation Society Ltd. for the year ending 31st December, 1960.
61. World Fishing. February, 1962.
62. World Fishing. May, 1962.
63. Quarterly Report of Sea Fishery Officer of the Devon Sea Fisheries Committee for the period ending 26th February, 1962.

64. Article. The Guardian. 21st April, 1965.
65. Fishing News No. 2708. 30th April, 1965.
66. Fishing News No. 2579. 9th November, 1962.
67. Fishing News No. 2635. 6th December, 1963.
68. Fishing News No. 2756. 1st April, 1966.
69. Quarterly Report of the Fishery Officer for the Devon Sea Fisheries Committee for the period ending 24th November, 1962.
70. Fishing News No. 2659. 22nd May, 1965.
71. Quarterly Report of the Fishery Officer for the Devon Sea Fisheries Committee for the period ending 22nd May, 1964.
72. Quarterly Report of the Fishery Officer for the Devon Sea Fisheries Committee for the period ending 20th November, 1964.
73. Fishing News No. 2772. 22nd July, 1966.
74. Report of the Sea Fisheries Officer for the Cornwall Sea Fisheries Committee for the period ending 31st October, 1964.
75. Personal communication from C.L. Holland (General Manager, Porthleven Fisheries, Ltd.). 4th October, 1967.

CHAPTER 6

DEMERSAL FISH - LANDINGS AND THEIR DISTRIBUTION, AND THE MAIN FISHING GROUNDS

1. Changes in Landings

The total annual landings of demersal fish have been reduced from approximately a quarter of a million cwt just after the war to half that quantity in 1965. The decline has been gradual, although occasional temporary reversals of the general trend have occurred (Table 25); these are to be expected as landings are influenced by so many variable factors, which include availability of fish on the grounds, weather and a fluctuating market demand. It is, perhaps, significant that the peak year of 1949 was also the first full year in which subsidies were paid, while during the following year maximum prices were released from control and prices rose temporarily, but consumer demand slackened for much of the year (Chapter 3). The landings of British and foreign vessels were reduced in 1950 and never subsequently regained their former prominence. The same holds true for the reduction that occurred in 1954 and coincided with the use of a larger minimum mesh size for trawl nets which was introduced as a conservation measure in April of that year.

The overall reduction in the landings made by foreign vessels has been, proportionately, much greater than that in British landings. There are several contributory factors, among which the following are probably the most important:-

- (a) Immediately after the war, considerable landings were made by Belgian trawlers which returned each year to operate from their war-time ports of refuge in south-west England; the numbers of such vessels soon declined.
- (b) Prices obtained at first sale at their home ports have become progressively more attractive to the Belgian fisherman. The higher landings of the late 1950's corresponded with low prices in Belgium.
- (c) Improved storage facilities on the vessels have enabled fish to be kept in a sufficiently good condition to be landed at home ports after fishing for several days around British shores.
- (d) Increasing antagonism of British fishermen towards their continental counterparts, particularly because of the apparent indifference of the latter to mesh regulations.
- (e) The slump that affected the industry in 1950 (see above) caused a greater percentage reduction in the landings made by foreign vessels, whose captains had a greater freedom of choice of ports at which to land fish than the British skippers, who were generally operating much nearer to home than to foreign ports.

Since 1950, following the considerable post-war reduction, landings made by foreign vessels at southern English ports have fluctuated widely. Owing to the relatively small annual weight of landings it is to be expected that they should exhibit a less stable tendency

than those made by British vessels and the fluctuations have often reflected the relative prices obtained at British and Continental ports. There is an earlier record of two Belgian trawlers landing 13½ tons of soles at Brixham because their home prices were lower; the fish had been caught in the Heligoland area.¹

Variations are also caused by other factors. Among the most important are the number of occasions upon which foreign skippers after fishing off British coasts have disposed of their fish on entering nearby ports to shelter from the weather or for repair. Further, when fishing is good relatively near to a British port, fish will naturally be landed at the most convenient place in order that a return to the grounds may be made as soon as possible. The annual frequency of this occurrence is not constant and, as the good catches may be obtained only during a short period of time over a small area, they may not be accompanied by a corresponding increase in landings made by British vessels.

TABLE 25Approximate Landings of Demersal
Fish (000 cwt) at Southern Ports

	<u>British Vessels</u>	<u>Foreign Vessels</u>	<u>Total</u>
1945	197	60	257
1946	210	40	250
1947	215	26	241
1948	202	27	229
1949	230	34	264
1950	168	13	181
1951	174	10	184
1952	159	8	166
1953	173	6	179
1954	149	2	151
1955	149	3	152
1956	136	6	142
1957	146	12	158
1958	140	13	153
1959	133	6	139
1960	129	3	132
1961	111	5	117
1962	118	5	123
1963	107	1	108
1964	123	2	125
1965	117	N.K.	N.K.

Note: Because the figures quoted are to the nearest thousand the total does not always equal its constituent parts.

Source: Calculated from the Sea Fisheries Statistical Tables and, for 1965 only, additional figures supplied by Statistics Department, Ministry of Agriculture, Fisheries and Food.

The demersal fish landed in southern England are not representative of those landed by all English and Welsh vessels: cod and haddock, which since the war have comprised over half the total catch by weight and value of demersal fish landed in England and Wales, are almost completely absent from all but the Newlyn landings. Plaice, and to a lesser extent hake, have been important both nationally and locally but other principal demersal fish of southern England have been of small importance on a national scale (Table 26).

TABLE 26

Value of five of the Principal Demersal Fish landed in Southern England and England and Wales, shown as an approximate percentage of the total Value of Wet Fish landed in the respective areas

	<u>1947</u>		<u>1952</u>		<u>1957</u>		<u>1963</u>	
	A	B	A	B	A	B	A	B
Hake	8	8	6	8	5	5	3	4
Plaice	10	13	9	8	14	10	18	12
Skates and Rays	15	2	15	3	19	2	14	2
Soles	*	2	7	2	11	2	11	2
Whiting	*	2	6	2	4	1	4	1

* Figures not known.

A. Landings made in southern England.

B. Total landings made in England and Wales.

Notes: 1. The value of each species has been taken as the national average value for that species during each of the years shown.

2. Foreign landings have been included in the landings for southern England but not in those for England and Wales. The effect of this inconsistency is very small and may be disregarded.

Source: Derived from the Sea Fisheries Statistical Tables.

Between fifteen and twenty species of demersal fish have been landed annually at southern ports in commercially significant quantities. The five species listed in Table 26 have been among those whose landings have been of greatest value, and in most years they have occupied the first five places. Other fish, which during the earlier years after the war were among those of highest total value, have included dogfish and turbot. An indication of the alterations in the relative importance of the various types of demersal fish can be obtained from Table 27.

TABLE 27

Total Weight (cwt) and Approximate Value
(£000) of Demersal Fish caught by British
Vessels in the English Channel during
1949 and 1965

<u>Type</u>	<u>1949</u>			<u>1965</u>		
	<u>Value</u>	<u>Order of</u> <u>Value</u>	<u>Weight</u>	<u>Value</u>	<u>Order of</u> <u>Value</u>	<u>Weight</u>
Bream	-	21	276	2	17	483
Brill	6	10	705	10	8	798
Cod	2	18	1,085	25	5	5,727
Conger Eel	8	8	5,711	3	15	1,127
Dab	2	15	708	6	10	1,815
Dogfish	55	3	44,533	1	18	413
Dory	2	15	988	1	18	184
Flounder	2	15	663	1	18	644
Gurnard	6	10	6,961	5	12	3,003
Haddock	-	22	10	4	14	1,211
Hake	28	6	6,045	11	7	923
Lemon Sole	2	15	332	15	6	1,549
Ling	6	10	3,612	1	18	523
Megrim	6	10	2,078	5	12	1,065
Monkfish	6	10	2,518	3	15	940
Plaice	83	2	15,398	164	1	22,474
Pollack	1	20	682	7	9	2,049
Red Mullet	7	9	2,340	-	22	9
Skate	91	1	38,269	40	3	8,515
Sole	46	5	4,500	86	2	3,065
Turbot	54	4	5,902	6	10	396
Whiting	25	7	12,780	36	4	18,761
Others and Mixed	22		6,477	37		11,245
TOTAL	460		162,573	469		86,919

- Notes: 1. Landings from the English Channel normally constitute about two-thirds of those made in the region, of which they may reasonably be regarded as representative.
2. The figures of weight for 1949 were derived from the Sea Fisheries Statistical Tables, and those for 1965 were provided by the Statistics Department, Ministry of Agriculture, Fisheries and Food.

Table 27 (continued)

- Notes:
3. - indicates a value of less than £500.
 4. Greater detail of the weight of landings is given in Appendix 1.
 5. The figures for "value" are approximations based on average values of the particular species, at first sale, in England and Wales.

Source: Obtained directly or derived from Sea Fisheries Statistical Tables.

The industry is dependent upon relatively few species for its economic operation, and in both 1949 and 1965 the five principal types comprised over 70% of the value of landings. Considerable changes occurred, however, and most of the principal species declined in absolute if not also in relative importance. The most notable exception was the plaice which, in 1965, was landed in greater quantity, as well as greater value, than for many years (see Table 28 and Appendix 1).

TABLE 28

Approximate Landings in 000 cwt of some of the Principal
Demersal Fish from all Ports in the Region

	<u>Hake</u>		<u>Rays</u>		<u>Whiting</u>		<u>Plaice</u>		<u>Conger</u>		<u>Dogfish</u>		<u>Gurnard</u>		<u>Soles</u>		<u>Others</u>		<u>Total</u>
	BR	F	BR	F	BR	F	BR	F	BR	F	BR	F	BR	F	BR	F	BR	F	
1945	9*17*		35	8	NK	4	52	-		NK	NK	NK	NK	NK	1		-		257
1948	6	7	48	6	NK	3	18	-		NK	NK	NK	NK	NK	1		-		229
1951	6	1	47	3	21	1	14	-		11	27	6	6	6	-		40		184
1954	6	-	36	1	15	-	17	-		15	14	8	4	4	-		34		151
1957	5	-	40	3	16	2	18	-		15	11	10	5	5	1		34		158
1960	4	-	31	1	23	-	10	-		10	8	6	5	5	-		35		132
1963	3	-	23	-	13	-	20	-		3	3	7	7	7	-		29		108
1965	1		17		20		26			3	3	4	3	4			40		117

* For the year 1946.

BR By British Vessels.

F By Foreign Vessels.

Notes: 1. Wherever possible, the figures have been derived directly from the Sea Fisheries Statistical Tables but, owing to the lack of information generally available, in some instances approximations have been made while in others the landings by British and foreign vessels have been combined.

2. Because the figures are to the nearest thousand, the sums of the individual columns do not all equal the totals.

3. Figures for 1965 do not include landings by foreign vessels.

Source: Derived from the Sea Fisheries Statistical Tables.

Overfishing has probably been a major cause of the reduction in landings of some species, among the most notable being the hake, which has been subjected to intensive prosecution by British, Spanish, French and other continental vessels on the grounds to the west of the British Isles.

The landings of these fish by British vessels at ports in the south of England have exhibited a gradual reduction but they did not decline as rapidly, during the initial post-war period as those at the major hake ports of Fleetwood, Milford Haven, Swansea and Cardiff, possibly because the grounds fished by the southern vessels were not exploited as intensively as the more important but more distant grounds to the south of Ireland and west of Scotland. The more rapid change in the landings made by foreign vessels was largely because a smaller number of vessels was visiting southern ports.

Overfishing may also have been partly responsible for the apparent reduction in the number of dogfish on the grounds, although it has been suggested² that an inflow of Atlantic water through the English Channel may have affected the distribution of the spur dogfish which is one of the more common types. There are also other possible causal factors, among them the changing habits of the pilchard, which forms a large part of the food for these fish in south-western waters. In recent years catches would probably have been greater but for the reduction in line fishing effort from Cornish ports. This final consideration has been significant in the decline, since the late 1950's, of the quantity of conger eels landed annually, although many were killed in the winter 1962/1963.

The action of trawls in intensively fished areas is probably a further factor responsible for reducing catches. Vegetation is almost certainly removed and thus there is less food for many small creatures which form part of the diet of some commercially important fish; these latter leave the area and catches decline, even though overfishing, in the strict sense, may not have occurred. If the larger fish leave the area first, as is most likely the case, there must be a predominance of small fish in the catch; as this is also symptomatic of overfishing, it is almost impossible to distinguish between the situations.

The landings of plaice were considerably reduced shortly after the war, and by 1948 were approximately one-third those of 1945. The fishery had experienced considerable pre-war exploitation but was rested during the period of hostilities and the stocks were allowed to recover, only to be subjected to intensive fishing in 1945 and 1946. A subsequent reduction was inevitable but the landings stabilised and between 1950 and 1961 displayed marked fluctuations but no overall tendency to fall. The stock had probably attained a state of equilibrium whereby the quantity of fish removed each year by the action of man, other predators and natural causes was equal to that replaced by birth and growth.

In 1963, the total landings of plaice made in England and Wales were considerably above those of earlier years and they have subsequently remained at a relatively high level. This has been particularly due to the good catches made from the North Sea but landings along the southern coast have been at a high and increasing level. In fact, the catches from

the eastern English Channel expanded considerably between 1961 and 1962, one year before the marked rise in the landings made nationally and from the western English Channel.^{3 4} It has been suggested that in the North Sea, because of improvements in ships and gear, trawlers have been working more distant and rougher grounds where larger plaice tend to predominate; this has given a longer term real gain to the stock as a whole by the reduction of effort on grounds supporting smaller and younger fish. The fisheries off the south of England may also have benefited from this change although it is likely that there has been an improvement in local stocks; increasing fishing activity at some centres may have been responsible for part of the increased landings though.

Overall, catches of soles both nationally and locally were also much inflated in 1963 although there were marked regional differences, all of which stemmed from the same cause: the cold weather in the early part of the year. Soles are particularly susceptible to low temperatures, they become lethargic and therefore an easy prey for trawlers;⁵ not unnaturally they also seek deeper waters where temperatures show fewer changes. In the eastern part of the English Channel, landings were very good indeed, but in the western areas soles made an offshore migration which took them away from the main fishing areas,* and in the Bristol Channel the late winter fishery was an almost complete failure.⁵ This had a marked effect on the landings at Newlyn, although later

* In the North Sea, to migrate to deeper water many soles had to move westwards and therefore towards British ports. Catches from the area were good.

in the year the catches improved. In contrast, the Brixham sole fishery followed the normal seasonal pattern. Not unnaturally landings have subsequently been universally reduced.

Landings of some fish displayed no sharp reduction over a short and almost immediate post-war period. The catch of skates and rays made by British and foreign vessels reached their peak of 68,000 cwt in 1949 and has subsequently, with intermediate variations, been gradually reduced. The landings of these fish, unlike those of many other types, showed little change between 1938 and 1946 but over the same period, fishing effort was reduced considerably and while 87,727 hours in 1938 were spent by 1st Class British trawlers fishing in the English Channel and 1,334 trips were made by liners operating in the same area, during 1945 the respective figures were 36,857 hours and 609 trips, and by 1949 they were 76,103 and 445. The immediate post-war catches were made as a result of a much smaller fishing effort than were those of 1938, the yield per fishing-hour was therefore greater during the latter period and it is indicated that stocks increased during the war, even though afterwards total landings of the fish were not significantly different from the immediate pre-war level.

The rise until 1949 accompanied increased fishing activity but it is probable that skates and rays, like so many other species, were becoming overfished, for although the fishing effort by 1st Class vessels continued to increase for several years (in 1951, 1st Class British trawlers spent 98,473 hours actively fishing in the English Channel and 1st Class liners made 658 trips), landings were showing a marked decline.

Mention has been made above of the reductions in landings of several of the principal species, but others shown in Table 27 justify comment. Most are probably a result of overfishing and this is almost certainly the case with turbot and monkfish which spend most of their lives in water of moderate depth where they have been subjected to intensive trawling.

Environmental changes have almost certainly been the main reason for the reduction in the landings of red mullet, which are primarily inhabitants of warmer waters and have not been caught off southern England in appreciable quantities since the early 1950's. The writer has personal experience of the disappearance of these fish from the waters off Portsmouth, where the abrupt nature of the event makes over-fishing an unlikely explanation. There has been no research on red mullet in this country, however.⁶

The landings of cod exhibit considerable annual variations (Appendix 1) but these are important only in that they probably reflect changes in the abundance of the fish in surrounding areas. Alterations in the habits of the species, which is not normally caught in appreciable quantities in the English Channel, may be indicated, however, and this could be associated with the fluctuating physical characteristics of the home waters of the fish or of those off southern England.

Codling in the 1963 class, spawned after the cold winter, have appeared along the south coast in unprecedented numbers and have been reported as far south as the Channel Islands, normally regarded as beyond the natural range of

the cod.⁷ There are many hypotheses to account for this behaviour, among them the following:

- (a) Either spawning or hatching was delayed so that when hatching occurred, more phytoplankton was available.⁸
- (b) Predation on eggs was reduced as the predators were either killed or forced by the low temperatures to migrate from the vicinity of the eggs.⁸
- (c) Cod eggs spawned in the Southern Bight were displaced south-westerwards by the effects of persistent north-easterly winds.⁷

The usually small landings of haddock have been marked by two rather more successful periods (Appendix 1). The first, in 1954-55, has been attributed to the species seeking new grounds,⁹ while the second, in 1963-1965, was probably a result of an exceptionally good year class, for the biggest North Sea brood recorded since the war occurred in 1961/62.⁸ Few haddock are landed anywhere in the region other than at Newlyn as the fish generally inhabit fairly deep and more northerly waters. It is possible that the increase in the catches after 1953 was caused in part by the tendency of Newlyn trawlers to fish more distant grounds to a greater extent than hitherto.

Although Table 27 shows an overall decrease in the landings, ten individual species, other than "Others and Mixed", were brought ashore in greater quantities in the later year. The changes were, in the main, small, particularly when compared with the reductions in the catches of dogfish and skate. The more significant, other than those affecting

cod, haddock and plaice, and already considered, concerned dabs, whiting, pollack and lemon soles. 1949 was a year in which landings of both dabs and whiting were small and unrepresentative of the late 1940's and early 1950's. Nevertheless, catches of dabs have, since 1963, been at a higher level than for many years and in 1964 the maximum post-war landings were made. There have been considerable variations in the quantity of whiting taken annually and the high level of catches in 1964 and 1965 is almost certainly largely a result of good broods in earlier years; the English whiting fisheries are based mainly on only two age groups at any one time, the two and three-year-olds, so that the fishery is very susceptible to fluctuations with year-class strength.⁷ The recent increases should not be considered without reference to their geographical distribution, however, for the greatest catches of whiting have been made at Brixham and Plymouth, where recently the fleets of medium-size trawlers have been enlarged with a consequent increase in the level of exploitation of the grounds relatively near at hand, on which the principal catches of whiting are taken.

Intensive exploitation of pollack has been both technically difficult and commercially unattractive, for the fish generally inhabit rocky areas (mainly off the south-west peninsula) and in any case have not been widely accepted as a popular food. They have not been subject to overfishing, although landings have been greater since 1953 than in the earlier post-war years probably largely because trawlers have been working deeper grounds and improved trawling techniques and the use of Decca Navigator have allowed more intensive exploitation of rougher grounds;

it is also possible that there have been some good year classes.¹⁰

Lemon soles are normally found in deeper waters than those inhabited by most other commercially significant species in the area. They are caught almost exclusively by trawlers from Newlyn, and the catches increased when these vessels increased their activity farther from the home ports as the yields from the more convenient grounds decreased. Landings by British craft from the English Channel reached their peak of 3,196 cwt in 1953 and then declined, presumably largely because of overfishing, until 1958. Subsequently, annual catches have displayed considerable variations but have at all times been above the level of those made shortly after the war.

2. Distribution of Landings

Because of the predominance in value of demersal fish over pelagic and shellfish, the main ports where they are landed are, with few exceptions, also those shown in Table 5, as the principal overall fishing ports in the region.

Landings of demersal fish have generally declined but the reduction has been most marked at the smaller ports. It is shown in Table 29 that the proportion of the total catch made at Newlyn and Brixham has increased from about 45% just after the war to about 55% to 65% in recent years, while that at ports classified as "Others" has been reduced from about 15% to between 6½% and 8½% over the same period. Such a marked contrast is not shown in Table 5, where the figures are based upon the value of all fish, partly because the value per unit weight of wet fish has been lower at the two principal ports than at those of the south-east where

high value plaice and soles form a more important part of the catches, but also partly because the importance of shellfish such as lobsters, crawfish and crabs is, at many of the ports, much greater than at Newlyn and Brixham.

At some ports, the generally declining tendency of the 1950's and early 1960's is now being reversed. It is to be hoped that this change is not temporary but much of the increase since 1963 has been made up of whiting, the landings of which have shown many fluctuations in the past (Appendix 1). The unusually large catches of cod, haddock and dabs have also made important contributions, as have the landings of plaice, which started expanding rather earlier and were largely responsible for the improved position at Hastings, Rye, Dungeness and Newhaven between 1960 and 1963 (Table 29) when elsewhere there was an almost universal decline. The more general improvement in catches has been since 1963 but at Newlyn the 1965 catch was below the level of that of 1963, following an increase to 50,000 cwt in 1964. It is true that the number of larger fishing vessels (i.e. those over 40 ft. in length) has expanded since 1960, but between 1963 and 1964 the catch from the English Channel per unit effort by trawlers in this category also showed an increase from .59 cwt to .64 cwt of demersal fish per hour. In 1965 the figure was slightly lower at .63 cwt but there is, as yet, insufficient evidence to suggest whether this reduction is significant.

TABLE 29

Landings (000 cwt) of Demersal Fish at thePrincipal Ports in Southern EnglandLandings by Foreign Vessels are shown in brackets

<u>1945</u>			<u>1948</u>			<u>1951</u>			<u>1954</u>		
<u>Port</u>	<u>Quantity</u>	<u>Port</u>	<u>Quantity</u>	<u>Port</u>	<u>Quantity</u>	<u>Port</u>	<u>Quantity</u>	<u>Port</u>	<u>Quantity</u>	<u>Port</u>	<u>Quantity</u>
Brixham	29(15)	Brixham	47(2)	Newlyn	48(7)	Newlyn	53(1)				
Plymouth	29	Newlyn	37(26)	Brixham	39(3)	Brixham	33(1)				
Newlyn	22(47)	Plymouth	23	Plymouth	16	Plymouth	10				
Mevagissey	19	Mevagissey	20	Mevagissey	17	Folkestone	9				
Folkestone	15	Folkestone	13	Folkestone	9	Mevagissey	7				
Rye	13	Padstow	8	St. Ives	8	St. Ives	6				
Hastings	12	St. Ives	6	Looe	6	Looe	4				
Ramsgate	6	Hastings	6	Padstow	6	Hastings	4				
Newhaven	6	Ramsgate	5	Hastings	4	Dungeness	3				
Dungeness	6	Looe	5	Newhaven	3	Porthleven	3				
St. Ives	6	Porthleven	5								
Others	33	Others	27	Others	18	Others	17				
Total	197(61)	Total	202(28)	Total	174(10)	Total	149(2)				

<u>1957</u>			<u>1960</u>			<u>1963</u>			<u>1965</u>		
<u>Port</u>	<u>Quantity</u>	<u>Port</u>	<u>Quantity</u>	<u>Port</u>	<u>Quantity</u>	<u>Port</u>	<u>Quantity</u>	<u>Port</u>	<u>Quantity</u>	<u>Port</u>	<u>Quantity</u>
Newlyn	53(12)	Newlyn	52(2)	Newlyn	46(1)	Newlyn	43				
Brixham	32	Brixham	31(1)	Brixham	20	Brixham	22				
Mevagissey	10	Plymouth	9	Plymouth	7	Plymouth	10				
Plymouth	8	Mevagissey	6	Hastings	6	Hastings	8				
Folkestone	6	Folkestone	5	St. Ives	4	Folkestone	6				
Hastings	6	Hastings	4	Dungeness	4	Newhaven	5				
St. Ives	5	St. Ives	4	Newhaven	4	Dungeness	4				
Looe	4	Dungeness	3	Folkestone	4	St. Ives	4				
Porthleven	3	Newhaven	3	Rye	3	Rye	3				
Dungeness	3	Ilfracombe	3	Mevagissey	2	Mevagissey	2				
Forquay	3										
Ilfracombe	3										
Others	10	Others	9	Others	7	Others	10				
Total	146(12)	Total	129(3)	Total	107(1)	Total	117				

Note: The apparent error in the addition of landings from foreign vessels at Brixham and Newlyn in 1945 occurs as all figures are shown to the nearest 1,000 cwt.

Source: Sea Fisheries Statistical Tables.

An indication of the distribution of the landings of some species is given in Appendix 2. Of the eight types shown, most are caught in fairly large quantities at Newlyn and Brixham. Fewer plaice and whiting are landed at Newlyn than at Brixham, where a greater proportion of the trawling is carried out on relatively shallow grounds, particularly in Lyme Bay. Plaice are caught mainly between March and September off Start Point and in Start Bay and Teignmouth Bay, and between 1962 and 1965 landings increased by a greater amount at both Brixham and Plymouth than at any other port. An expansion of the stock was probably an important contributory factor, but almost certainly also of considerable significance was the change in the fishing fleets already cited in connection with the whiting fishery at the ports.

The greatest landings of soles are made in the spring at Newlyn and the fish are caught on the Trevoze grounds off the north coast of Cornwall (Fig. 14). The larger vessels from Plymouth and Brixham have also exploited these grounds in the past and French and Belgian trawlers continue to do so. The steam trawlers which were at Plymouth until 1955 sometimes visited the area but the cost of the journey, the difficulty of getting crew members who were prepared to stay at sea for up to ten days, and the potential loss of gear owing to the number of wrecks on the grounds, all acted as deterrents. The 90 ft. trawlers from Brixham made the journey until more recently, and although quite considerable landings were sometimes made,* they faced similar problems to those of the Plymouth vessels.

* It was reported in Fishing News No. 2491 of 3rd March, 1961 that the Brixham trawler Agnes Allen, after a voyage of nine days to the grounds off Trevoze Head, landed a catch which sold for £1,437. This was a record for landings made in recent years at the port.

Coarse fish such as skate, dogfish and conger eels have been landed mainly at south-western ports and particularly in Cornwall where many have been caught by lining. In the eastern part of the Channel, the principal catches have been made at Folkestone, again largely by liners, although significant quantities of skate have in most years been taken by trawlers from other centres.

The only significant landings of hake have been made at Newlyn, Brixham and Plymouth, from which larger vessels have trawled in the deeper waters to the south of Ireland and in the western approaches to the English Channel. The catches made at Brixham and Plymouth have been reduced almost to nothing as the larger vessels have been scrapped, sunk or sold and the remaining fleets of smaller boats have restricted their fishing to grounds nearer home. In 1947 and 1950 the landings of hake at Newlyn were inflated by catches from foreign vessels of about 7,400 cwt and 1,300 cwt respectively. Those made by British vessels have therefore not declined significantly until recently; this may seem paradoxical in the light of the claim that the hake has been subject to long-term overfishing, but it must be remembered how the Newlyn fishing industry developed after the war with the number of local trawlers fishing more distant and deeper waters increasing for several years.

3. Fishing Grounds

Many of the vessels catching demersal fish in the region are small and operate on grounds within 30 miles of the shore; the range of most trawlers and liners from ports to the east of Brixham is considerably less, and the most distant grounds consistently exploited are about 100 miles from the coast and fished by Newlyn vessels. Some of

the longest voyages have been made by Brixham trawlers when prosecuting fisheries off the coast of north Cornwall.

Although in many areas there have been alterations in the intensity and method of fishing, few changes have occurred in the geographical distribution of fishing grounds, except during the period immediately following the war, when the industry was becoming re-established and when several areas formerly closed to fishing because of the presence of obstructions, were reopened.

The disruption experienced as a result of wreckage was far less than in the North Sea but a considerable number of ships had been sunk in the western approaches, and at a meeting sponsored by the Devon Sea Fisheries Committee in Plymouth early in 1946 it was suggested that owing to wreckage in the area sounding equipment should be made available to all boats.¹¹

The remains of aircraft, ships, moorings and obstructions placed as anti-invasion measures caused problems to fishermen in the eastern part of the English Channel and in the Thames Estuary; it is recorded in an early post-war edition of Fishing News¹² that a request was being made to the War Office and to the Admiralty by the fishermen of Rye, Hythe and Folkestone to clear their grounds of obstructions placed as anti-invasion measures. A later edition¹³ recorded that the Air Ministry had agreed to move an obstruction (a mooring)¹¹ which interfered with fishing in Westgate Bay, near Margate.

In 1954, R.H.C.F. Frampton, the District Inspector of Fisheries in the south-west of England for the Ministry of Agriculture and Fisheries, outlined in his unpublished paper¹⁴

the main fishing grounds exploited by vessels from within the region under his jurisdiction.

The larger trawlers were fishing in four principal areas:

- (a) Lyme Bay.
- (b) 6-10 miles south of the Eddystone and westwards towards the Lizard.
- (c) South of the Wolf Rock and westwards towards the Scillies.
- (d) Off the north coast, between Pendeen and Lundy Island.

Vessels from Brixham operated as far afield as the Scilly Isles in the west and Portland in the east, but the areas usually fished were to the south of the Eddystone and off Wolf Rock. The larger Plymouth trawlers fished mainly to the south and west of the Eddystone, while many of those from Newlyn worked to the south and west of Wolf Rock, although the grounds off the north Cornish coast were popular early in the year. While the above is a record of the main trawl fisheries, it is by no means comprehensive, and there is evidence that more distant fisheries were sometimes prosecuted.*

Grounds fished by smaller vessels were usually nearer to the shore; the medium-size Brixham trawlers operated in Lyme Bay from a position off Start Point in the west and eastwards to Portland, but the small trawlers from Brixham and the other south-western ports usually fished

* In Fishing News No. 1721 of 16th March, 1946, it was stated that on 8th December, 1945, after ten days on the Jones Bank (100 miles west-south-west of Land's End), 8,675 stones of hake were landed (at Newlyn) from a British steam trawler.

much nearer their home ports on suitable grounds all round the coast.

The larger liners from the Cornish ports generally fished farther afield than the trawlers and exploited two main areas.

- (a) Extending between 30 and 50 miles south-east of the Eddystone to between 20 miles and 50 miles south of Dodman. Mevagissey vessels operated mainly to the west while those from Polperro and Looe were in the east.
- (b) An approximately semi-circular area to the west of a line between points 70 miles north and south of Newlyn. Within this region the vessels from both Newlyn and St. Ives operated, although the liners from the latter port fished mainly between 40 miles and 70 miles west to north-west of St. Ives Head. The largest Newlyn liners sometimes operated up to about 120 miles from the shore.

Small Cornish liners fished from several ports and their grounds were generally much nearer to the coast than were those of the larger vessels. Most of this type of fishing was practised in the Mevagissey area, popular grounds being either between 8 and 12 miles to the south of Dodman Point or eastwards from the port to within about one mile of Polperro in between 7 and 20 fathoms of water.

After the war the inshore grounds of Devon and Cornwall were more important for demersal fish than they have been in recent years. It was reported¹⁵ in the autumn of 1945 that steam trawlers from Plymouth and the larger

Brixham trawlers had been making good catches, generally near land. By 1954, when Frampton's paper was available, the areas of fishing were similar to those of 1946, but few grounds near the shore could support anything but a small scale demersal fishery, the line fisheries were declining and there had been a tendency for the areas farther from the coast to show an increase in fishing intensity.

Since 1954, lining has continued to decline, trawling techniques have altered to permit trawling on grounds previously open only to liners, and the demersal fishing function of Newlyn has changed from being primarily one of line fishing to one of trawling; consequently, many of the grounds in use to-day were being fished in 1954 and 1945 but in the earlier years line fishing was almost the only method by which the more distant fisheries were prosecuted by British vessels, although continental, and particularly Belgian, trawlers had operated in the area for many years.* Since trawling has also become the predominant method for British vessels, the larger Newlyn boats have operated over a wide area from about 100 miles off Start Point, round the south-west peninsula to Lundy Island, in depths down to 65 fathoms.

Not all of the more productive grounds in the south-west are a considerable distance from the shore and the area off Trevoze Head may be quoted as an example. Since its post-war opening in 1946¹⁶ it has provided good fishing (page 218) for foreign trawlers as well as vessels from Newlyn, Brixham, Plymouth and Milford Haven.

* Before the war, sailing smacks from Brixham had used Newlyn as their base while trawling on the south-western grounds.

Brixham vessels now fish no more distant from home than the Eddystone in the west and off Chesil Beach in the east while Plymouth trawlers concentrate mainly on the grounds around the Eddystone and the eastern and western limits of their activities are off Start Point and The Lizard respectively.

At Teignmouth, the fishing fleet has increased in size in the last few years as rising catches attracted more men. Larger vessels were purchased (at the end of 1960, there were two boats over 40 ft. in length and by the end of 1964, the number was seven) and fishing now takes place up to ten miles from the shore compared with less than one mile in earlier years.¹⁷

Between the eastern end of Lyme Bay and approximately the longitude of Worthing very little demersal fishing is practised. Most of what does take place is trawling from vessels less than 25 ft. in length within four miles of the shore. It is possible that a more important fishing industry could be supported, particularly with the presence of a large centre of consumption, but as far as can be determined there has been no research to ascertain whether worthwhile fishing grounds exist farther out to sea in this area. It is unlikely that a larger fishery would develop naturally, as historically this is not an important fishing area; there are no large local vessels capable of safely carrying out a systematic exploration of areas farther out to sea or, indeed, near-by fishing organisations able to support such a venture. Most of the fishermen have other jobs, operate part-time and

consequently are unlikely to be willing to lose fishing time on a search for new grounds which in any case might well prove fruitless.

To the east of Worthing, although trawling has been carried out by small vessels near to the shore along almost all of the coast, larger vessels from Newhaven, Folkestone and, for a few years after the war, Ramsgate have operated with trawls or lines on more distant grounds in the Channel. Ramsgate trawlers also worked in the southern North Sea. There have been few changes in the areas fished since the war. During the summer most fishing has been on the inshore grounds and, in the winter, the larger trawlers from Newhaven have operated on grounds between the approximate limits of 18 to 25 miles south of Beachy Head to 20 to 25 miles off Shoreham (Fig. 15) and the larger liners from Folkestone have fished on the Varne, La Colbart and Bullock Banks. Smaller liners have fished closer to the shore on rockier grounds for conger eels and cod.

Trawlers from Hastings and Rye fish throughout the year, mainly in Rye Bay but also in Hythe Bay. The smaller boats from these and neighbouring centres exploit the same grounds during the warmer months but do little fishing during the winter, a period usually given over to repainting and repairing and to herring and sprat fishing. Most other fish have moved offshore and the weather is usually less reliable than during the summer. The areal extent of the main demersal fishery is limited to seaward by the rough nature of the sea-bed and its boundary extends approximately from Folkestone Pier to Dungeness Point to Fairlight (just east of Hastings). The main catches of plaice are made in

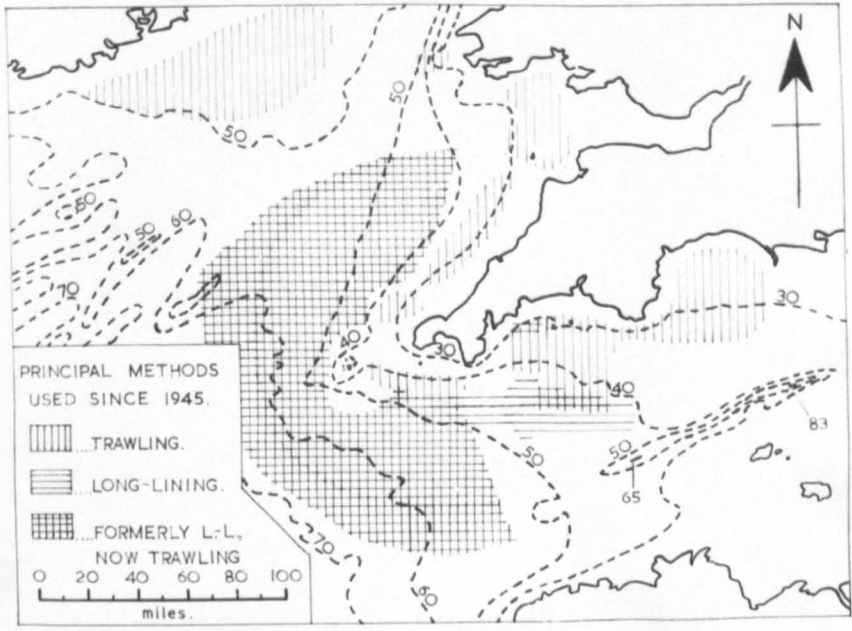


FIG 14. Principal Demersal fishing grounds exploited by British vessels from South - West England.

PECKED LINES SHOW DEPTH IN FATHOMS.

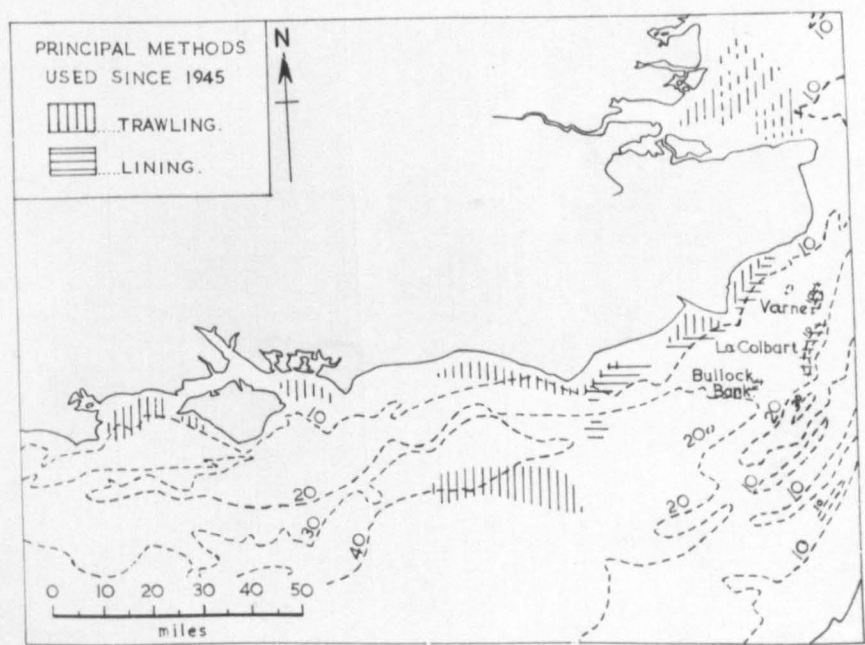


FIG 15. Principal Demersal fishing grounds exploited by British vessels from South East England.

THESE GROUNDS ARE GENERALLY OF A MUCH LOWER ORDER OF SIGNIFICANCE THAN THOSE SHOWN IN FIG.14. PECKED LINES SHOW DEPTH IN FATHOMS.

February and March, when the fish are feeding after spawning farther offshore, but plaice predominate in the catches until about June and soles for the remainder of the summer, during which the plaice have dispersed after their post spawning feeding period; they next congregate inshore in the autumn.

Long lines have been used by local vessels off Eastbourne in areas where the sea-bed is rocky; in the spring, fishing takes place between three and five miles from the shore but during the autumn the main line fishing area is on the Diamond Bank, between eight and ten miles out to sea. Boats from Eastbourne and other areas on the shores of Pevensey Bay usually trawl on local grounds but make trips to Rye Bay if the weather is good.¹⁸

Small scale fishing for demersal varieties is fairly general in the Thames Estuary channels,¹⁹ and of particular local importance is the fishery for skates and rays by boats from Whitstable (and also from the Essex side of the estuary) during the close season for sprat fishing.

To conclude the survey of the demersal fishery of southern England, a brief examination will be made of the average time spent travelling and fishing in each voyage by larger trawlers. The figures in Table 30 have been derived from others available in the Sea Fisheries Statistical Tables and must be used with caution as although they show an overall trend they have several marked limitations:

- (a) No details of voyages of other types of demersal fishing vessels (e.g. liners) are included.
- (b) The figures are representative only of fishing in the English Channel.
- (c) No details of voyages of the important fleet of small vessels is given.

TABLE 30

Changes in Voyages of larger British Trawlers
Fishing in the English Channel

	<u>1945</u>	<u>1948</u>	<u>1951</u>	<u>1954</u>	<u>1957</u>	<u>1960</u>	<u>1963</u>	<u>1965</u>
Days travelling on each trip	.86	.96	1.00	1.00	1.06	.92	.92	.67
Days fishing on each trip	.40	.67	.97	1.08	1.12	.88	.89	.81

Source: Derived from Sea Fisheries Statistical Tables.

Note: "Larger" trawlers means those classified as 1st class (over 15 tons gross) before 1st January 1955 and over 40 ft. registered length after that date. So the figures for 1957, 1960, 1963, and 1965 are not strictly comparable with those for earlier years. However, the actual difference between the categories is negligible.

After the war, both travelling and fishing time increased initially, but the latter increased to a much greater extent. This indicates that while only a slightly larger number of vessels were fishing the more distant grounds and changes of fishing grounds were therefore probably small, fishing was becoming, at an early stage, much less productive and active fishing time was increased in an endeavour to make fishing economic.

The reasons for the changes since 1951 are more complex and largely indicative of the effect of the changing composition of the fleet. The early 1950's saw the decline of the fleet of steam propelled vessels from Plymouth and there has been a progressive reduction in the number of vessels of over 70 ft. in length fishing from Brixham (Table 22); these vessels had often travelled considerable distances to

fish and their removal probably had the effect of damping the otherwise sharply rising tendency of both travelling and fishing time on each trip. It might be expected that this would be counteracted to some extent by the increased number of trawlers (some of which had come from Brixham) of over 70 ft. in length fishing from Newlyn, but it must be remembered that many of the trips from that port are made out of the English Channel and into the Bristol Channel or the area south of Ireland; they are therefore not included in the figures in Table 30. Although the larger vessels from Brixham and Plymouth had also operated on grounds other than the Channel area, most of their trawling was to the south and west of the Eddystone and off Wolf Rock.¹⁴

The lower figures of the 1960's are probably a result of the factors mentioned above, combined with the effect of the revival of inshore trawling at such ports as Brixham, Teignmouth and Newhaven which, being based largely upon vessels in the 40 ft. to 60 ft. category, has meant that a greater part of the fishing effort made by vessels of over 40 ft. in length has been contributed by smaller boats making relatively short voyages to catch their fish.

Perhaps the most disquieting information given in Table 30 is the small proportion of total time spent actively fishing on each voyage. This is now showing an improvement but it has usually been less than half and in 1945 was less than one-third. This does not appear to compare unfavourably with the average of about 43% in recent years for all larger British vessels landing demersal fish at English and Welsh

ports, but it should be remembered that the latter figure includes details of voyages to the Barents Sea and around Iceland, the Norwegian coast and Bear Island and Spitzbergen on which roughly two weeks out of a three week round trip are spent simply getting to and from the fishing grounds.

Fundamental changes might be made in the type of vessel used in order to optimise fishing efficiency but these would be expensive and a marked improvement could be made simply by extending the fishing time, but not the travelling time, of the vessels which at present make voyages of less than 24 hours' duration.

It must be remembered that one of the strong points of the demersal fishery in the area is its ability to land quality fish in fresh condition. It would be foolish if the duration of each voyage were to be increased at the risk of landing stale fish and having any advantages offset by lower prices realised for the catches.

If greater care were taken over the preservation of fish at sea, more use were made of ice and the fish handled rather less than at present, voyages of many vessels could probably be extended by at least 24 hours with little or no reduction in the quality of the fish when landed; the catches would, in any case, still be considerably fresher than those made at the major east coast ports.

Ice has been taken to sea by the larger vessels at Newlyn, Brixham and Plymouth throughout the period but there are few instances of the practice being adopted in smaller boats although it has recently been introduced at Newhaven and has become common at Brixham during the last few years in trawlers making 36-hour or 48-hour trips. On some of these boats, which comprise the principal part of the fleet at the port, fish are also being boxed at sea to reduce handling.

1. Report of the Fisheries Officer for the Devon Sea Fisheries Committee. 3rd December, 1949.
2. Annual Report of the Director of Fisheries Research, 1965. Unpublished. Fisheries Laboratory, Lowestoft.
3. Fish Stock Record 1965. Ministry of Agriculture, Fisheries and Food and Department of Agriculture and Fisheries for Scotland. Unpublished 1966.
4. North Sea Plaice Stocks. Laboratory Leaflet (New Series) No. 11. Fisheries Laboratory, Lowestoft. Ministry of Agriculture, Fisheries and Food. Unpublished 1966.
5. Fish Stock Record, 1963. Ministry of Agriculture, Fisheries and Food and Department of Agriculture and Fisheries for Scotland. Unpublished 1964.
6. Personal Communication from H.A. Cole. 31st August, 1967.
7. Fish Stock Record 1964. Ministry of Agriculture, Fisheries and Food and Department of Agriculture and Fisheries for Scotland. Unpublished 1965.
8. Personal Communication. J.P. Bridger, 19th October, 1965.
9. Quarterly Report of the Fishery Officer to the Devon Sea Fisheries Committee. 30th November, 1954.
10. Personal Communication from G.H. Buchanan-Wollaston. 8th September, 1967.
11. Fishing News No. 1722. 23rd March, 1946.
12. Fishing News No. 1698. 6th October, 1945.
13. Fishing News No. 1718. 23rd February, 1946.
14. The Fisheries of Devon and Cornwall. R.H.C.F. Frampton. Unpublished, 1954.
15. Fishing News No. 1697. 29th September, 1945.

16. Fishing News No. 1727. 27th April, 1946.
17. Fishing News No. 2611. 21st June, 1963.
18. The Fisheries of the Sussex Coast. Ministry of Agriculture, Fisheries and Food. Unpublished. Date not known.
19. The Fisheries of the Kentish Coast. Ministry of Agriculture, Fisheries and Food. Unpublished. Date not known.

CHAPTER 7

PELAGIC FISH - LANDINGS AND THEIR DISTRIBUTION AND THE MAIN FISHING GROUNDS

Since 1957, the overall landings of pelagic fish have shown no marked tendency to decline although they have been below the level reached during the period 1950-1956 (Table 31). Immediately after the war the catches were at their lowest level; this is in marked contrast to those of demersal fish but was largely associated with a low level of exploitation partly caused by the concentration of the fishery upon the latter.

Landings from foreign vessels have generally been small and restricted almost entirely to mackerel brought to Newlyn by French drifters. Since 1958 the quantities have been greater than in most earlier years and it has been suggested¹ that the high prices obtained for mackerel at Newlyn have been largely responsible.

The landings were once made in the late winter and spring but in recent years have been as early in the season as November. This is after the main season for the inshore line fishing and prior to the period during which the offshore drift fishery is prosecuted by east coast vessels; consequently, prices for fresh mackerel at this time have been good and the Frenchmen have been encouraged to land at Newlyn rather than return home with their catches. Even later in the season, when landings of mackerel have been made by east coast vessels, the quantities involved have been small and the prices have encouraged landings from foreign vessels.

When fishing to the south-west of the British Isles, foreign vessels are sometimes forced by adverse weather

conditions to shelter at British ports where they may land their fish, but in many instances landings of mackerel have been made at Newlyn by French drifters because, owing to the relative distances covered, approximately three journeys could be made from the fishing grounds to Newlyn to every two to the French ports in the Brest Peninsula.

It should be noted that the landings represent the results of only a small part of the French mackerel drifting effort in the area and, while the number of vessels making landings each year has varied, it reached 15 in the 1959-1960 winter and 16 in 1964-65.² Table 31 indicates that the quantity of fish landed could not provide profitable employment for so many vessels, which obviously landed many more fish in France.

TABLE 31Landings (000 cwt) of Pelagic Fish
at Southern Ports

	<u>British Vessels</u>	<u>Foreign Vessels</u>	<u>Total</u>
1945	N.K.	N.K.	103
1946	72	1	73
1947	85	1	86
1948	110	1	111
1949	127	6	133
1950	142	1	143
1951	164	*	164
1952	215	*	215
1953	205	*	206
1954	138	*	138
1955	172	1	173
1956	183	*	184
1957	106	*	106
1958	133	2	135
1959	112	2	114
1960	96	4	100
1961	106	3	109
1962	112	3	115
1963	101	1	102
1964	131	2	133
1965	102	N.K.	N.K.

Source: Derived from Sea Fisheries Statistical Tables.

Notes: 1. * Landings less than 500 cwt.

2. Where the total does not equal the constituent parts it is due to the rounding of the figures.

Mackerel, pilchards and sprats have in most years comprised the main part of the catch of pelagic fish and appreciable landings of herrings have been made only when east coast vessels have landed their fish at Dover (Table 32).

The structure of landings of pelagic fish in southern England therefore bears little relation to that in the coastal areas of England and Wales as a whole, where in 1946 and 1965, herrings represented 95% and 54% respectively of all landings by weight of pelagic fish. The comparable figures for the area under survey were 4.5% and 1.9% respectively.

In the past the situation has differed markedly, and until the early 1930's a moderately important herring fishery was prosecuted off Plymouth; 93,754 cwt was landed at the port in 1930 but by 1937 the landings had dwindled to insignificance. During the 1920's and 1930's various environmental and biological changes³ occurred in the area of the western English Channel. Perhaps the most fundamental was a rise in the mean sea surface temperature of approximately $\frac{1}{2}^{\circ}$ C near Plymouth and somewhat more to the west and south-west, as shown by the difference between the means for the periods 1903-1927 and 1928-1959. The running means of annual temperature off Plymouth suggest a steepening of the rise during the 1920's when some of the major biological changes began. This rise in sea temperature was possibly accompanied by a change in the emphasis of water movements and was directly or indirectly responsible for many or all of the other changes, including the virtual disappearance of the herrings from the area.

TABLE 32

Landings (000 cwt) of Pelagic Fish from
all Ports in the Region, 1946-1965 (including
Landings from Foreign Vessels, except in 1965)

	<u>Pilchard</u>	<u>Sprat</u>	<u>Mackerel</u>	<u>Herring</u>
1946	52	9	8	3
1947	62	12	9	4
1948	66	19	19	7
1949	61	22	20	20
1950	79	29	20	15
1951	81	39	29	14
1952	93	54	24	44
1953	104	52	30	19
1954	58	39	29	12
1955	93	38	29	12
1956	114	52	14	3
1957	53	27	22	4
1958	79	30	22	4
1959	67	22	23	3
1960	58	19	21	2
1961	53	24	29	2
1962	40	45	30	-
1963	38	30	33	1
1964	34	60	36	3
1965	27	46	28	2

- Sources:
1. Derived from Sea Fisheries Statistical Tables.
 2. Figures supplied by J.P. Bridger (Ministry of Agriculture, Fisheries and Food).
 3. Figures supplied by Statistics Department (Ministry of Agriculture, Fisheries and Food).

- Notes:
1. "-" indicates landings of less than 500 cwt.
 2. The figures for mackerel landed during the years 1946 to 1949, inclusive, are approximations

Herrings were also caught in greater numbers off the north coast of Cornwall until the end of the war;* similar factors may have influenced the reduction here and, although evidence of the existence of larger bodies of fish has occasionally been produced** ϕ since the war, annual catches from the area have usually been small. The only regular, although limited, quantities of herring taken off the southern coasts since the war have been from south Kent and Sussex.

Few pilchards are normally landed at British ports outside southern Cornwall although an autumn and winter fishery was prosecuted off Plymouth for several years after the war. In recent years, particularly during warm summers, adult pilchards and their eggs have been reported as far north as the Dogger Bank and the Minch⁴ and large catches are sometimes made by drifters in the East Anglian herring fishery.⁴ In 1951 33,400 cwt, out of a total for the country of 115,800 cwt, was landed from the North Sea but catches for that area are usually less than one-tenth this size. $\phi\phi$ In October and November there is a small fishery

* Landings of Herrings at St. Ives totalled 7,229 cwt in 1944, but 16,362 cwt in 1940. Fisheries in Wartime. Ministry of Agriculture and Fisheries. H.M.S.O. 1946.

** Herring traces were seen 30 miles north of Longships by a Belgian vessel, and in early April 1964 a drifter enmeshed 380 stone of herring in mackerel nets, indicating that a larger haul might have been made had smaller mesh herring nets been used. Report of Sea Fishery Officer of the Cornwall Sea Fisheries Committee. 31st October, 1964.

ϕ 2,102 cwt was landed at St. Ives in 1950.

$\phi\phi$ It is possible that quantities of pilchards larger than those recorded were landed but not classified separately from catches of herrings.

off Boulogne and the fish are caught in trammel nets in Rye Bay at this season.⁵

It is shown in Table 32 that the total landings of pilchards fluctuated between 1946 and 1949, after which they increased to a maximum in 1953 and then exhibited considerable annual variations, including a rise to the highest post-war landings in 1956, until a persistent decline, which affected almost all ports, set in after 1958. The Plymouth fishery became extinct and landings at Newlyn, Mevagissey, Polperro, Porthleven and Looe were considerably reduced.

Until the last few years, catches have generally been greatest at Newlyn but they were at a low level in the early years after the war, probably partly because long lining was so profitable that fewer boats converted to drifting. Evidence of good long line catches is provided in the quarterly reports of the County Sea Fisheries Officer^{6 7} and in Fishing News.⁸ It was also recorded in 1947⁹ that a smaller number of boats was taking part in the summer pilchard fishery (not only at Newlyn, although the port has been important in this season throughout the period) each year because older men were forsaking the industry, the cost of nets and gear was high and younger men were loth to leave other more profitable fisheries. There is little doubt, however, that pilchards were in short supply in the Mount's Bay area^{10 11} during at least part of the period, although low prices received for the fish¹² also probably had an adverse effect on landings.

After 1947 the landings at Newlyn were at a much higher level, probably as line fishing was becoming less profitable, particularly for smaller boats, and more were converting to pilchard drifting for part of the year. It is also stated that in the summer of 1948 the fishery in Mount's Bay was good,¹³ but the deduction that more fish were available in the area could be false, for if more vessels were operating they had proportionately a greater opportunity of locating the fish. The opening of the cannery at Newlyn early in 1949¹⁴ provided a further outlet and probably also greater encouragement.

In recent years the universal decline has affected Newlyn to a greater extent than most other ports, perhaps owing to a reason similar to that which was largely responsible for the small landings at the port in the immediate post-war years; namely, the availability of other more profitable forms of fishing. Many of the smaller boats have taken to fishing with hand-lines for mackerel; this method has been of considerable importance since 1961 and, as long as it provides a more profitable summer fishery than pilchard drifting, the latter will continue to decline. The mackerel fishery is prosecuted from the late spring until the early winter and covers the period formerly regarded as the lining and pilchard fishing seasons; its growth has been aided by the exhaustion of the lining grounds near the shore for these are the only areas which can be safely fished by the small liners.

For crew members unable to take part in the mackerel fishery or for owner-skippers who have sold their boats, employment is often available at Newlyn on the trawlers of

the Stevenson fleet and, although it entails relatively long absences at sea, there is some compensation in the moderately high wages.

In general the main catches have been made between June and December⁴ but recently the season has commenced and been completed rather earlier in the year (Table 33). In most years, the difference between the start of the fishery at the various ports has been small and although no consistent pattern of relationship is discernible the insignificance of the winter and early spring activities at Newlyn is noteworthy.

TABLE 33Monthly Landings of Pilchards (00 cwt) at
the Principal Ports during Selected Years

		J	F	M	A	M	J	J	A	S	O	N	D
	Newlyn	-	-	1	7	7	6	11	36	14	5	3	2
1946	Mevagissey	9	2	23	31	-	-	-	3	2	34	40	31
	Looe	2	3	8	14	-	-	-	-	-	3	24	16
	Newlyn	-	-	1	2	20	35	40	51	43	107	47	12
1952	Mevagissey	5	1	19	7	22	35	28	36	7	1	22	19
	Looe	11	-	11	2	6	17	33	30	16	4	49	29
	Newlyn	-	1	-	-	-	22	39	56	42	27	3	-
1958	Mevagissey	98	60	19	5	6	21	8	19	11	1	1	20
	Looe	50	51	3	-	13	55	27	26	14	3	-	15
	Newlyn	-	-	-	-	3	10	10	27	18	15	1	-
1964	Mevagissey	1	3	-	21	25	15	27	18	22	3	-	-
	Looe	1	1	-	22	16	14	11	9	10	2	1	-

Source: Statistics Department, Ministry of Agriculture,
Fisheries and Food.

The seasonal nature of the fishery is largely associated with migrations of the pilchards, and it has been suggested by the results of studies⁵ of egg distribution in 1950 and surveys by echo sounder in 1950 and 1955, carried out by Ministry research vessels, that the fish are fairly abundant from the end of March to the beginning of May in the western part of the Channel, where they are feeding on zooplankton in preparation for spawning. Mackerel fishermen from Lowestoft have often reported dense echo traces in March and April between the Wolf Rock and the area of their fishery, 50-100 miles westward. During the same fishery pilchards have been frequently

caught in the mackerel nets.⁵ It has also been suggested⁴ that during March the main shoals usually appear near the Wolf Rock and move rapidly eastwards up the English Channel and between Cornwall and Ireland; spawning begins almost at once and continues until September or October,⁴ but eggs have sometimes been found off Plymouth as late in the winter as December and January.³ A peak is reached in June or July⁴ and until about June the main spawning areas are in the middle of the western English Channel, but in July pilchard eggs may be found throughout the English Channel, though at a fairly low density.⁵

From the results of studies of egg distribution¹⁵ carried out in the western Channel during various periods between April and July 1937, March and July 1938, and March and June 1939, it was shown that spawning took place between April and July, with a maximum in late May and early June;* the main centre of spawning was in the mouth of the Channel but eggs were found over a broad area from the mouth of the Channel westward to about 8° West and also along the north coast of Cornwall. Spawning did not appear to take place in the north-western area of the Celtic Sea or southwards beyond the edge of the Continental shelf. There is evidence³ of an autumn and early winter inshore spawning period which has been substantiated by the results of surveys carried out in 1958-1960. These indicated that in October pilchard eggs were restricted to waters relatively close to the shore of Devon and Cornwall and to the south-west of Ushant;³ this

* It should be noted that no cruises in any of the years 1937-1939 took place earlier in May than 27th or later in June than 7th.

has led to the hypothesis that pilchards lay two or more batches of eggs in each season,⁴ although it has also been suggested that there could be two races of pilchards in the Channel which spawn at different times.³

During the summer some fish move into the North Sea but probably most remain in the Western Channel and there is a movement to inshore Cornish waters in the late summer and autumn.⁵ All the pilchards probably withdraw to deeper water to the west in winter, and this action marks the end of the autumn and winter fishery. It has been suggested that the fish which spent the summer in the Western Channel are joined by those from the southern North Sea and this possibility is strengthened by the evidence of landings off Boulogne in the autumn.

In the light of this information, factors contributing to the frequent diminution of the landings at Newlyn during the cooler seasons can be suggested, but it must be remembered that in the spring some pilchard boats from the port have often been converted to long lining and over-large landings should not be expected at this time. Nevertheless, migrations must be expected to have some effect and the general easterly movement of the fish in the spring and summer is likely to be important and, stemming from this, the inshore concentration might not occur in Mount's Bay to the same extent as farther east. As an alternative, it is possible that the winter withdrawal to deeper water occurs earliest in the western areas.

A considerable amount of information is available concerning the probable migrations and spawning grounds of adult pilchards, and collections of larval and post-larval fish up to a length of 4-5 cms have been made¹⁶ but little

is known of the somewhat larger immature pilchard or sardine; the only fishery occurs along the coast of Brittany for specimens mainly from 12 cms to 17 cms in length and one to two years old.⁴ There is evidence that the fish spend at least part of their immature stage in inshore waters, for Cunningham¹⁷ stated that shoals of fish, mainly young sprats, taken by seine nets in the Hamoaze during September (presumably of 1893) contained a small proportion of young pilchards, 2½ to 4½ inches in length. The same author recorded that young pilchards of the same age were regularly taken close to the shore in the Gulf of Marseilles; these latter fish were almost certainly of a different stock from those caught in the English Channel.

Within the broad pattern of the migrations, there have been many variations, the effect of which has been to make the pilchards unpredictable, both in the areas off the Cornish and Devonshire coasts where they have appeared in quantity and in the seasons during which they have been caught. The situation has at times been aggravated by the habit of the fish of moving in large shoals so that extreme catches, with their resultant shortages and gluts have not been infrequent. The uncertainty of the fishery is indicated very clearly in the quarterly reports of the Chief Fishery Officer for Cornwall.

In 1946 the usually productive summer fishery in Mount's Bay was poor¹¹ and the spring fishery of that year was recorded as being good at Looe and Polperro, variable at Mevagissey and poor at Newlyn.¹⁰ Two years later the spring fishery was poor in most areas.¹⁸ In 1950 the main spring landings were at Mevagissey and Looe¹⁹ whereas in 1952 they were mainly from Mount's Bay (and presumably made

principally at Newlyn) and Mevagissey.²⁰ In 1953 they were from Newlyn, but also from Mevagissey and Looe,²¹ and in 1956 there were almost simultaneous spring fisheries from Mount's Bay and in the south-east²² (of Cornwall). The autumn fishery, which has usually been best in south-eastern waters and in 1957 was a failure in Mount's Bay,²³ was recorded as being good near Newlyn in 1950.²⁴ The winter fishery, which declined to insignificant proportions in the 1961/62 season and never recovered, has also been prosecuted mainly in the south-east, but again not without some changes; in the Report of the Cornwall Sea Fisheries Officer of 16th February, 1951 it was stated that pilchards had not appeared off Mevagissey for the second winter and that there were few off Plymouth; during the following winter good catches were made at both ports.

Although many of the variations in pilchard landings are not significant except to show the unpredictability of the habits of the fish, two changes, apart from the overall decline in landings, may be observed which have had a fundamental effect upon the fishery; these are the decline of the winter fishery and the disappearance of the fish from the waters off Plymouth. These shoals in any case formed the basis of a late autumn and winter fishery. Although pilchards are probably in evidence in the offshore waters in winter (page 165) they are beyond the range of the small Cornish boats and this has had unfortunate repercussions within the industry, for the pilchard fishery provided an economic mainstay for large sections of the fishing community during the winter, which is the season of minimal activity in long lining, potting and the vacation industry.

The seasonal changes in total pilchard landings have been plotted^{25 26} elsewhere but the main trends may be summarised.

Between 1947 and 1953 maximum landings were made in early winter but pilchards were also caught from the spring to late autumn. The summer catches were small until 1952, when landings were good in June, July and August. In 1953 good landings were made in August, although the largest monthly catches occurred in November and December. 1954 was a year in which total catches were small and the maximum was in August.

In 1955 and from 1957 to 1959, January was the month when the total landings were largest, although, except for those of 1957, the summer landings were also relatively good. During 1956, when good catches were made during the summer and in January and December, the maximum occurred in June.

Since 1960, the maximum monthly landings have occurred during the late summer, but it is only since 1962 that the winter landings have become insignificant, although a decline had been evident for some time (Table 34).

It may be noted that the winter fishery has failed during at least one other extended period in the present century, for it was recorded²⁷ in 1913 that the winter fishery was practically non-existent after steadily declining for a decade.

TABLE 34

Landings (cwt) of Pilchards
November-February

1956-57	36,205
1957-58	35,947
1958-59	19,671
1959-60	17,790
1960-61	16,846
1961-62	3,081
1962-63	983
1963-64	740

Source: Personal Communication - J.P. Bridger (Ministry of Agriculture, Fisheries and Food).

The present distribution of landings is all the more unfortunate as pilchards have their maximum fat content and reach a good weight for their size during November, December, and sometimes January; consequently, they are most suitable for canning during a period when they are no longer available in quantity. The summer catches, on the other hand, contain a high proportion of breeding fish which are poor for canning and have a tendency to break up on being turned out of their tins.²⁶

Cushing estimated that the total stock of pilchards in the Channel in 1950 was about 800,000 tons⁵ and therefore suggested that variations in the annual catch could be quite independent of variations in abundance.⁵ The same writer points out that an unusually high level of landings between 1904 and 1906 may possibly have been

due to a real increase in abundance and so presumably implies that large increases in abundance do affect catches. Considerable decreases will obviously have the effect of reducing catches.

It has been shown that the work of the Pilchard Development Unit confirmed that the fish were in the area in considerable quantities in summer but by no means confined to the inshore grounds traditionally fished. In winter the inshore grounds were found to be bare, but it has been indicated that pilchards might exist in quantity farther offshore.

While the repercussions from not fishing the entire pilchard stock have been most serious in recent years, earlier evidence of the occurrence of this situation was provided by experiments carried out between 1935 and 1938²⁸ when discrepancies were found between the spawning season of pilchards, as deduced from the state of the gonads of commercially caught fish, and as proved by the presence of eggs in plankton samples.

There has been an absolute reduction in the number of vessels fishing for pilchards as older men have retired and, owing to the uncertainty of the future of the industry, have not been replaced by younger men. In summer the owners of some of the vessels continuing to fish for pilchards have shown a greater interest in shark fishing and the holiday industry. As these latter forms of activity take place during the hours of daylight while pilchard drifting is a night occupation, it has been possible to combine them, sometimes with different crews operating the same boat for the day and the night-time

activities.

All sections of the fishing industry have been affected by rising costs, and unfortunately the pilchard fishermen have had little compensation in higher prices for fish sold (Table 18) and many have been forced out of fishing. The vicious circle has been completed by the canners, who provide the main market for pilchards but are unable to pay the fishermen more if they are to keep their retail prices on the home market within competitive range of the large imports of South African and South-West African products.

The canners' inability to reduce their costs and pay the fishermen a higher rate is largely due to the uneconomic method of operation forced upon them by the irregularity, in both time and quantity, of the pilchard landings. Several canning factories have closed in recent years and the situation is unlikely to improve as long as the pilchard fishery is prosecuted mainly by vessels which are less than 40 ft. in length, have a limited range and whose activities are affected to a considerable extent by the weather.

Although the total annual landings of mackerel in the region since the war have, until 1964, always been smaller than those of pilchards, the total value of mackerel, which fetch a higher price per unit weight, has frequently exceeded that of pilchards; the difference has been particularly marked in recent years as the pilchard landings have been reduced so drastically. Because of the high proportion of the landings often made in the past at Newlyn by east coast vessels (Table 24), the benefits of this relatively high value have not always been felt within the region.

The total quantity of mackerel landed by British vessels in the area since 1950 has varied between 13,500 cwt in 1956 and 33,000 cwt in 1964. During this period the deep sea fishery became insignificant and the inshore line fishery developed to dominate the scene, particularly during the summer months but more recently in the autumn and early winter as well. The offshore drift fishery has taken place mainly between February and May or June.

The predominance of the south-western ports (Appendix 3) is again evident, the greatest landings generally having been made at Newlyn, initially from the east-coast drifters, but more recently mainly from the small line-fishing vessels. Significant catches have also been made at some of the more easterly ports, where recent increases have corresponded with the growth of "feathering". Prior to 1948, when east coast vessels visited Newlyn for the first time after the war, landings at the port were small, particularly as no large inshore fishery had developed. The small landings of 1956 reflected the poor season experienced by the deep-sea drifters.

The different nature of the line and deep-sea drift fisheries and their concentration in the south-west is best explained by an examination of the migration pattern, which has been studied and documented in considerable detail.^{29 30 15}

In the English Channel and Celtic Sea, mackerel spend at least part of the winter period densely packed on the sea floor in several areas which have a bank and gulley form of underwater topography as a common feature. There is no uniform pattern in depth and temperature of the water or in

distance from the shore. Recognised hibernating regions include the edge of Hurd Deep (which extends approximately from 40 miles south-east to 40 miles south-south-west of Start Point) in about 40 fathoms, along the southern side of the Vergoyer Bank near Boulogne in 12-18 fathoms, on numerous small scattered sandbanks off Dieppe in 11-14 fathoms and in the Smalls and Saltees areas in 30-50 fathoms.. There are probably many other wintering areas in the Celtic Sea* and some fish may spend this period on the continental slope.

From about December onwards the fish disperse from these areas and move towards their spawning grounds which, for mackerel from the English Channel and Celtic Sea, are in the vicinity of the 100 fathom underwater contour which marks the edge of the continental shelf. During this movement towards the spawning grounds the fish rise to the upper layers of the water.

The evidence of studies carried out between 1937 and 1939¹⁵ upon the distribution of eggs and young suggested that spawning started in mid-March, rapidly reached a maximum in mid-April, declined gradually through May and June and was very slight by the end of July. There was also a continuous movement eastwards and slightly northwards of the main area of spawning activity, which initially occupied a small area at the western edge of the continental shelf. By mid-April it was widespread over the Celtic Sea with two main concentrations to the south of Ireland and to the west of the mouth of the English Channel respectively. These

* It is recorded in the Quarterly Report of the Fishery Officer to the Cornwall Sea Fisheries Committee on 12th May 1956 that a French trawler caught mackerel near the Great Sole Bank (about 170 miles west south-west of Lands End).

centres were transferred in easterly or north-easterly directions until by mid-July the small numbers of eggs found were almost entirely to the east of the longitude of Scillies but it was indicated that separate nuclei were still in existence and now being transferred eastwards along the Channel and northwards into the Irish Sea respectively. During the spawning stage the fish are living in the upper layers of the water.

Spawning activity is extended in both space and time, for the eggs in any one mackerel do not all mature at the same time and consequently are extruded over a period while the fish is travelling. The spread is further accentuated by the varying times of arrival at the spawning grounds of fish which have spent the winter in different areas.

After the spawning migrations, the fish disperse and spend the summer and autumn months in the inshore waters around the coasts. This is a further pelagic stage in their annual cycle and the range of migration is not known, although Steven²⁹ suggests that they spread throughout the Irish Sea and quotes other authors^{53 31} as stating that they may go through the Straits of Dover and into the southern North Sea. In recent tagging experiments³² mackerel released off Land's End have been re-taken as far away as off North-West Scotland. In the winter all, or nearly all, return to the sea floor. By using this hypothesis of mackerel habits and migrations, Steven accounted for the principal existing and extinct mackerel fisheries in the south-west of England (Fig. 17). Since the publication of his papers considerable changes have affected the fisheries, but these do not necessarily indicate that the theory is no

longer valid, or indeed that there need have been any fundamental change in the habits of the fish. It is quite possible that the only major alteration has been in catching methods. The offshore drift fishery of the spring months has declined for reasons which may not have been connected with the abundance of the fish, while the growth of the catches of the summer inshore line fishery can be largely associated with the increase in the number of operators.

Steven recognised three main fisheries, all of which were dependent upon drift nets for their catches:

1. Plymouth Channel Fishery.
2. Newlyn Inshore Fishery.
3. Newlyn Deep-sea Fishery.

The Plymouth Channel Fishery was prosecuted between about December or January and May and probably not generally nearer than about 10 miles from the shore. During the season the centre of activity moved gradually westward from a position off Start Point until the fishery culminated in the spring sometimes as far as 40 miles south-west of Lizard Head. This fishery was of considerable importance in the latter part of the 19th century when boats from many parts of the south coast and also from Yarmouth and Lowestoft participated, but it declined and finally came to an end in 1926. To show that mackerel continued to inhabit the waters off Plymouth, Steven quoted evidence of fish being trawled from the bottom of this area during the early months of the year by French vessels,* and further

* French vessels still trawl for mackerel in this area.

testimony was provided by a British steam trawler and the Research vessel of the Marine Biological Association, which caught mackerel between January and April in the years 1936 to 1939. Although the sample from the British vessels was small, a westerly movement of the fish was indicated and Steven used this information and the knowledge of the movement of the extinct Plymouth Channel fishery to postulate that the mackerel were moving from their wintering area on the edge of Hurd Deep towards the spawning region. During this period the change over from the demersal to the pelagic stage occurs, and if it is assumed that the fish rise to the surface successively rather than together it is reasonable to expect that some might be trawled from the bottom at the same time of the year and in the same area as others are taken from near the surface with drift nets.

While fish were caught on or near the sea-bed in the winter and early spring after 1926, there is no mention of evidence that they were present in the upper layers of the water, so Steven obviously assumed that there had been little change in this situation even though no commercial drift fishery persisted. This supposition appears to be justified by the evidence of mackerel catches made off the Cornish coasts in the winter months during the years 1949 to 1953, when several quarterly reports of the Fishery Officer to the Cornwall Sea Fisheries Committee make mention of "trailing" and "feathering" during the winter months. The report of 16th February 1949 stated that it was a new feature of the season, that of 16th February 1951 quoted many boats as operating in January, but by 12th February 1953 landings

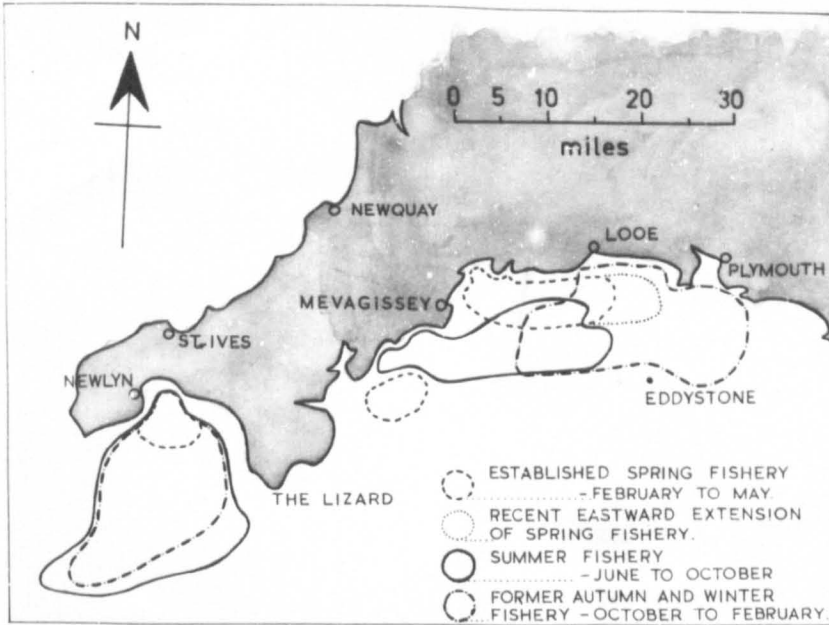


FIG 16. Limits of Pilchard Drift Fisheries.

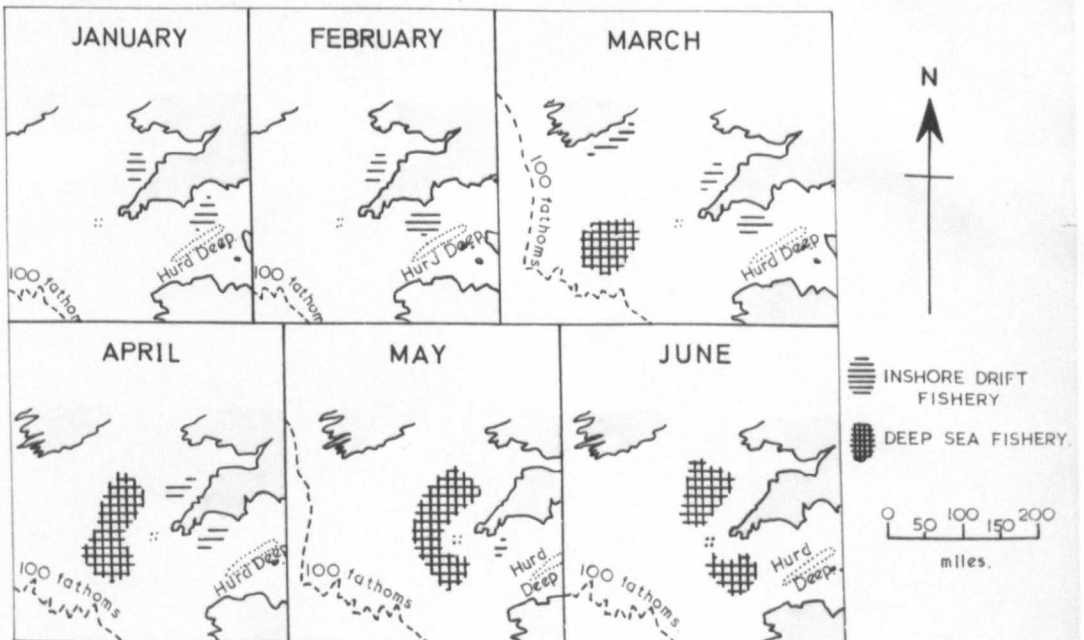


FIG 17. Generalised charts showing times of Fishery for Mackerel in different parts of the English Channel and Celtic Sea. (After Steven)
Note: The Inshore Line Fishery is not included.

were recorded as being poor.

A letter dated 31st March, 1951 from a Looe fisherman to Fishing News reported that almost the entire Looe fleet was engaged in mackerel fishing in the Eddystone area using feathers or coloured elastic bands as bait (Fishing News No. 1981. 7th April, 1951).

It appears likely that the migration still takes place although perhaps on a smaller scale than in the past. The fishery died in the 1920's partly because of a falling demand for mackerel and also possibly because of a reduced catch per unit of effort. The short-lived revival of the late 1940's and early 1950's was on a very small scale and may have started for purely fortuitous reasons, but it is quite likely that the poor winter pilchard catch at some ports in 1950 and 1951 * ** encouraged more fishermen to try other forms of activity in that season. After the small winter catches of mackerel in 1953 fishermen obviously soon lost interest; in 1955 the pilchard catches were at a maximum in January.

Following the failure of the winter pilchard fishery in recent years, an exploitation of this mackerel stock is worthy of consideration and, if it should prove to be successful, more continuous employment could be provided for many fishermen and, if lines are used for catching the fish, at little extra cost for capital equipment.

* In the Quarterly Report of 16th February 1951 by the Fishery Officer for the Cornwall Sea Fisheries Committee, it was stated that for the second winter pilchards did not appear off Mevagissey and there were few off Plymouth.

** Nevertheless, the overall annual maxima of pilchard landings was made in the early winter of each of these years (page 247).

The Newlyn Inshore Fishery, like the Plymouth Channel Fishery, has also not been prosecuted on anything but a small scale for many years. Steven²⁹ outlined the grounds as extending from 50 to 20 miles north north-west of Land's End; fishing usually commenced in December or early January in the north and moved gradually south south-west until the season ended three or four months later. Although the fishery occurred off the coasts of North Devon and North Cornwall, Newlyn was the main centre when the activity was at its height, but since the war such fishing as has taken place has been conducted by local vessels from St. Ives, although occasional sorties may have been made to the area by east coast drifters, when the weather or the fishing further out to sea has been poor.*

The movement of the fishery displays marked similarities to that of the Plymouth Channel Fishery and Steven concluded²⁹ that it is based upon fish which had wintered in the area of the Smalls and were also pursuing their spawning migration.

The area of the fishing grounds as outlined above is in broad agreement with information given to the author by a fisherman of St. Ives who stated that fishing in February was 30-40 miles north and by east from St. Ives; it gradually moved round Bishop's Rock in approximately a semi-circular path and in June-July was in Mount's Bay, about 25 miles offshore. Presumably the fishery was then concentrated on the mackerel which still remained in fairly large shoals prior to their coastwise dispersal and after migrating eastwards from the edge of the continental shelf. Since 1962 this fishery has not been prosecuted.

* Although there is no evidence of this practice having taken place since the war, Steven²⁹ mentions that it had occurred in the past.

The Newlyn Deep-Sea Fishery is the only one of the three fisheries mentioned by Steven to have any marked significance in the post-war period.

From the studies of the distribution of the eggs and young of the mackerel,^{29 15} and the movements of the fishing fleet,²⁹ there was seen to be a close correlation between the changes in the main centres of fishing activity and the eastward spawning migration of the large body of mackerel which initially concentrated in the vicinity of the 100-fathom contour in the Celtic Sea.

The migration pattern appears to have changed little and evidence of the eastward movement and bifurcation of the main shoals is provided by the Quarterly Report, dated 12th May, 1953, of the Fishery Officer for the Cornwall Sea Fisheries Committee. This showed that the western mackerel fishery had taken place over a fairly wide area in the Celtic Sea, 100-150 miles from the Cornish coast, but that the later shoals moved to 50 miles west by south from Wolf Rock and 30 miles west by north of Sevenstones.

In 1959 it was suggested³³ that the location of the early spring shoals was tending to be farther to the south, but the "new" locations were in the southernmost of the fishery areas outlined in Steven's map (Fig. 17). Consequently while fewer mackerel may have been concentrated to the north it is also possible that the three vessels operating were unable to search the northern area in sufficient detail to locate the shoals.

The early winter landings from the Celtic Sea made since 1963 by French drifters have caused surprise in Newlyn, for they have been made several months before the deep-sea drifting season usually commences. A change in the habits of the fish is possible if the spawning migration has started earlier than in the past. These "early" deep-sea

fish could form part of the annual migration from inshore waters to the hibernating regions in the Celtic Sea, although they may have been caught because they were swimming higher in the water than has been normal at this stage. It is also possible that the only change was made by the French fishermen, who used their drift nets much earlier in the season than had been usual.

Steven made no mention of the inshore mackerel fishery, presumably because of its small importance at that time. It is obviously associated with the inshore post-spawning dispersal of the fish, but whether the extension of the fishing season during the last few years into the early winter indicates a change on the part of the fish as well as the fishermen is uncertain. The concentration of activities off the south-west peninsula and particularly around Newlyn has probably occurred largely because, while some of the fish may travel hundreds of miles after spawning, most are likely to spread out around the coasts nearest to their spawning grounds. The fishing effort has also been greatest in this area, having been contributed to partly by fishermen made redundant from the declining pilchard and line fisheries but also by individuals attracted by the success of the fishery.

Although the word "dispersal" has been used in connection with this phase in the annual cycle of the mackerel, it should not be interpreted in the absolute sense. The fish also aggregate in the summer and, while these shoals do not cover the same area as those in the spawning migration, they are often dense enough for a fisherman to catch a mackerel on each of his fifteen or

so hooks when "feathering" and sometimes occupy a sufficiently large area to make seine-netting from the beach temporarily a lucrative occupation, even in the eastern part of the English Channel.

Sprats have been widespread around the British coasts during the autumn and winter months and in recent years the principal catches have been made from the Moray Firth and the Firth of Forth. In the south of England large quantities have been landed only from the Thames Estuary, the Torbay area, and in some years from the waters off Poole. Regular, but usually much smaller, catches have been made from the south coasts of Kent and Sussex, and fish have sometimes been brought ashore at Weymouth, Looe, West Bay, Ilfracombe and some other ports. Until the 1930's, there was a small fishery in the Solent; it has not been revived since the war but whitebait, which are the young of herring and sprats, are often caught at Portsmouth. There were a few sprats off Shanklin in January 1964³⁴ and early in 1965 sprats were taken by Poole vessels from Freshwater Bay in the Isle of Wight.³⁵

During the winter period the fish are inshore prior to spawning, which probably takes place in the open sea in the spring and early summer.³⁶ At this time they do not feed,³⁷ possibly because of the seasonal minimum of plankton density. The fat which is contained in the fish at the beginning of the season gradually diminishes as their gonads are maturing³⁷ and they become less suitable for canning³⁸ and for fresh eating.

They probably disperse after shoaling in shallow waters but it is uncertain whether this occurs before spawning or after, when they are searching for food.³⁷ Robertson has quoted several authors to show that the spawning period is prolonged, and off Plymouth eggs have been found between mid-January and mid-July.^{39 40} It has been suggested that in the southern half of the North Sea spawning lasts from March to August, with a maximum in June.⁴¹

Occasionally sprats visit the inshore waters out of season, and in August 1959 a large shoal moved very close to the shore at West Bay for a few days; the performance was repeated in the same month of the following year and on both occasions fish were caught by beach seine.⁴² The possibility that the shoals were of whitebait (and therefore not out of season) can almost certainly be discounted for they were seen, and many or all were taken for processing, by persons experienced in handling, and therefore able to identify the fish. Robertson³⁷ quotes evidence of occasional summer landings at Plymouth and other unseasonal appearances of the fish at Morecambe, Great Yarmouth and some distance to seaward of the mouths of the Tyne and the Tees.

Landings reached a high level during the years 1951 to 1956 but did not attain similar proportions again until 1962 (Table 32). In most years the greatest proportion of the catch has been taken in and around Torbay and after the war the fishery in this area expanded as trawling for sprats developed at the expense of seine-netting.

The other principal sprat fishery along the south coast has been from Poole, where annual landings were at about 5,000 cwt between 1950 and 1953 and reached 10,202 cwt in

1951. They were considerably above the level of 1947 (Appendix 3), 1948 and 1949 (approximately 2,000 cwt and 500 cwt respectively) but were eclipsed by the catch of about 12,000 cwt which was made in 1945, and in earlier years even larger hauls had frequently been made.

During the early 1950's the good catches were to a considerable extent the result of the growth of pair-trawling from Whitstable after the winter of 1950/1951. Landings rose from about 6,000 cwt in 1951 to 32,000 cwt in 1956 when the port contributed about 60% of the total sprats landed in the southern area. The men responsible for this diversification of the Whitstable fishing industry moved from the north shore in 1950⁴³ and although their methods were new, sprat-fishing had been practised in the Thames Estuary for many years, principally from Southend.

The subsequent decline was more marked than the rise and in 1960 less than 1,000 cwt of sprats was landed. While it is undoubtedly true that the fish either did not visit the area in their former numbers or were dispersed to such an extent that large catches could not be made, the reduction was accelerated when a fishery commenced in the area of the Wash in January 1959 after a preliminary survey by a research vessel had indicated the presence of extensive stocks of sprats there.⁴⁴ Several fishermen took their boats from the Thames and used Wells as their base in Norfolk during at least part of each winter until 1962/1963.

Annual landings from the Wash have increased* but

* Fish Stock Records show an increase in the landings from the Wash from 23,805 cwt in 1958/1959 to 48,447 cwt in 1961/1962. After declining to 39,850 cwt in 1962/1963, probably due to the hard winter and to the return of the Thames boats to their home waters for much of the season, the catch exceeded 85,000 cwt in 1963/1964 and 93,000 cwt in 1964/1965, mainly because of the success of larger vessels which were operating in increasing numbers from Grimsby.

during the 1961/1962 season there was a high proportion of herring in the catch⁴⁴ * and in January 1962 several vessels returned to the Thames,⁴⁵ where there were heavy concentrations of sprats again. The landings made at Whitstable in that year were, at 8,475 cwt, the highest since 1957.

In the early part of the next season many pair-trawlers from the Thames fished in the Wash but most returned home in the first week of December to exploit the reported large number of sprats.⁴⁶ The Thames fishery then made a promising start but continuous bad weather early in 1963 caused the shoals to disperse and by February the boats were back in the Wash.⁴⁵ As a result landings at both Whitstable and Southend in 1963 were below the level of those of the previous year.

By the winter of 1963/1964 a marked resurgence, which continued into the following year, was evident in the Thames. The beginning of this change of fortune, despite the fact that it is not shown by the total landings for the year 1963, had been first noticed in the 1962/1963 season when good catches of small two-year-old sprats were made.⁴⁷ These fish were abundant as three and four-year-olds in 1963/1964 and 1964/1965 respectively,⁴⁷ but made little contribution to the 1965/1966 catch, which was much smaller.

From 1954 until 1961, landings from the south coast were less than those of the earlier 1950's and at Poole they were sometimes insignificant (Appendix 3). On occasions

* Information in the Fish Stock Record for 1961 shows that, by weight, herring comprised 16.1% of the landings in 1961/1962 compared with 6.1% in 1960/1961.

there were few fish to be caught, but difficulties of disposal sometimes led to the situation where fishermen did not exploit the shoals which were in evidence.

TABLE 35

Comparison of Sprat Landings at Whitstable
and along the South Coast (000 cwt)

	<u>1946</u>	<u>1947</u>	<u>1948</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>
Whitstable	6	-	-	-	-	6	9	19	23	24
South Coast	9	12	19	22	29	33	45	33	13	15
	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>
Whitstable	32	12	5	1	1	3	9	5	27	12
South Coast	20	14	25	20	19	20	38	24	33	34

Source: Derived from Sea Fisheries Statistical Tables.

This problem has never been completely solved and in 1963/1964, a good catch made on the Dorset coast might have been larger as might also have been that from Torbay, but for the restricted market; very large shoals had been reported from both areas.⁴⁸ In the following winter there were good concentrations off Plymouth and in Torbay but they were not heavily fished, as the price of transport to fish-meal plants at Hull and Grimsby was prohibitive; the only fish landed were those which could be sold for human consumption.⁴⁷

The problem of the disposal of surplus sprats is not new and before the war Robertson³⁷ stated that "although the landings of sprats in this country are not heavy, it quite often happens that the market is glutted, and in these circumstances sprats are sometimes sold at a very

low price for manure." There are also records of a similar outlet being used some forty years earlier.⁴⁹ Early in 1945 Devon fishermen were told to suspend operations when there was a surplus⁵⁰ and during the winter of 1952/1953 arrangements were made, presumably for the first time, for reduction at the Herring Industry Board's plants at Great Yarmouth, Hull and Grimsby,⁵¹ but it is recorded that a large sprat shoal at West Bay in the autumn of 1956 was untouched because there was no market and, as in later years, to transport the fish to the nearest meal and oil plant at Grimsby would have been uneconomic.⁵²

Difficulties of disposal have also faced the fishermen of the Thames in times of high catches, and quotas have sometimes been imposed upon landings.⁴⁸ Nevertheless, the area has been more favourably placed than the south-western ports in relation to some of the largest consumers, and transport costs to the main canneries, petfood manufacturers and fish meal processors in the east of the country* have obviously been smaller. In January 1964 the development of a scheme for exporting the fish in bulk by carrier vessels considerably relieved the situation for a good proportion of Thames vessels and about 1,500 tons were taken in the 1963/1964 season direct from the fishing grounds.⁴⁸

The few instances quoted serve to indicate the frequency of the excess of potential, and sometimes actual, supply over demand at an economic price to the fishermen.

* Greater detail of the location of the processing plants is given in Chapter 9.

Landings are restricted by the wholesalers or processors, prices are low and fishermen become embittered. This situation often occurs when fish are of poor quality and unsuitable for smoking or canning; consequently, the only outlets are to meal and oil or petfood, which provide a lower price, and in recent years also a lower subsidy, than those to human consumption.

1. Conversation with the Ministry of Agriculture, Fisheries and Food, Fishery Officer, Newlyn.
2. Figures obtained from The Harbour Master, Newlyn.
3. The distribution of some Plankton Animals in the English Channel and its Approaches - A.J. Southward. Journal of the Marine Biological Association, Volume 43, No. 1, January 1963.
4. J.P. Bridger, Personal Communication. 26th March, 1965.
5. The number of pilchards in the Channel. D.H. Cushing. H.M.S.O. 1957.
6. Report of the Cornwall Sea Fishery Officer. 19th September, 1945.
7. Report of the Cornwall Sea Fishery Officer. 21st November, 1945.
8. Fishing News No. 1733. 15th June, 1946.
9. Report of the Cornwall Sea Fishery Officer. 4th September, 1947.
10. Report of the Cornwall Sea Fishery Officer. 22nd May, 1946.
11. Report of the Cornwall Sea Fishery Officer. 5th September, 1946.
12. Fishing News No. 1719. 2nd March, 1946.
13. Report of the Cornwall Sea Fishery Officer. 18th November, 1948.
14. Fishing News No. 1888. 18th June, 1949.
15. Spawning of Mackerel and Pilchard in the Celtic Sea in 1937-1939. P.G. Corbin. J.M.B.A. Vol. XXVII. No. 1. November, 1947.
16. The Experiments on the Cornish Pilchard Fishery 1947-1948. W.C. Hodgson and I.D. Richardson. H.M.S.O., 1949.

17. The Life History of the Pilchard. J.T.Cunningham. J.M.B.A. Vol. III, No. 2. March 1894.
18. Quarterly Report of Chief Fishery Officer for the Cornwall Sea Fisheries Committee for the period ending 19th May, 1948.
19. Quarterly Report of Chief Fishery Officer for the Cornwall Sea Fisheries Committee for the period ending 15th June, 1950.
20. Quarterly Report of Chief Fishery Officer for the Cornwall Sea Fisheries Committee for the period ending 29th May, 1952.
21. Quarterly Report of Chief Fishery Officer for the Cornwall Sea Fisheries Committee for the period ending 22nd May, 1953.
22. Quarterly Report of Chief Fishery Officer for the Cornwall Sea Fisheries Committee for the period ending 12th May, 1956.
23. Quarterly Report of Chief Fishery Officer for the Cornwall Sea Fisheries Committee for the period ending 14th February, 1958.
24. Quarterly Report of Chief Fishery Officer for the Cornwall Sea Fisheries Committee for the period ending 14th November, 1950.
25. Unpublished graphs drawn by G.H. Buchanan-Wollaston.
26. Ph.D. Thesis. University of London. 1964. The Pilchard and its Fishery. M.B. Culley.
27. The Scientific and Economic Aspects of the Cornish Pilchard Fishery. H. Swithinbank and G.E. Bullen. Mera Publications No. 1. 1913.
28. The Seasonal Cycle of the Cornish Pilchard. C.F. Hickling. J.M.B.A. Vol. XXVI. No.2. August 1945.
29. Contributions to the Biology of the Mackerel I. G.A. Steven. J.M.B.A. Vol. XXVII. 1948.

30. Contributions to the Biology of the Mackerel II.
G.A. Steven. J.M.B.A. Vol. XXVIII. 1949.
31. The Mackerel and Mackerel Fishery. E. Ehrenbaum.
Cons. Perm. Int. Expl. Mer: Rapp. Proc. - Verb.
Vol. XVIII. Special Report 1914.
32. Annual Report of the Director of Fisheries Research,
1965. Fisheries Laboratory, Lowestoft.
33. Quarterly Report of the Fishery Officer of the
Cornwall Sea Fisheries Committee. 15th May, 1959.
34. Fishing News No. 2656. 1st May, 1964.
35. Fishing News No. 2696. 5th February, 1965.
36. Sea Fisheries - Their Investigation in the U.K.
Edited by M. Graham. Ed. Arnold, 1956.
37. The Sprat and Sprat Fishery of England.
J.A. Robertson. Fishery Investigations, Series II,
Vol. XVI No.2. H.M.S.O. 1938.
38. A Short Account of Sprat and Sprat Fisheries.
J.A. Robertson. Unpublished. Duplicated 1929.
39. Notes on Teleostean Ova and Lava observed at Plymouth
in the Spring and Summer, 1909. A.E. Hefford.
J.M.B.A. Vol. IX, 43. Plymouth, 1913.
40. A Record of Teleostean Eggs and Larvae observed at
Plymouth in 1897. E.W.L. Holt and S.D. Scott.
J.M.B.A. Vol. V, 156. Plymouth, 1897-1899.
41. Eier und Larven von Fischen des Nordischen Planktons.
E. Ehrenbaum. Keil und Leipzig. 1905 and 1909.
42. Personal Communication. Fishery Officer, Southern
Sea Fisheries District. 2nd February, 1964.
43. Fishing News No. 2192. 22nd April, 1955.

44. Fish Stock Record, 1961. Ministry of Agriculture, Fisheries and Food and Department of Agriculture and Fisheries for Scotland. Unpublished, 1962.
 45. Fishing News No. 2536. 12th January, 1962.
 46. Fish Stock Record, 1962. Ministry of Agriculture, Fisheries and Food and Department of Agriculture and Fisheries for Scotland. Unpublished, 1963.
 47. Fish Stock Record, 1964. Ministry of Agriculture, Fisheries and Food and Department of Agriculture and Fisheries for Scotland. Unpublished, 1965.
 48. Fish Stock Record 1963. Ministry of Agriculture, Fisheries and Food and Department of Agriculture and Fisheries for Scotland. Unpublished, 1964.
 49. The Life Histories of the British Marine Food Fishes. W.C. McIntosh and A.T. Masterman. C.F. Clay and Sons, 1897.
 50. Fishing News No. 1660. 13th January, 1945.
 51. Fishing News No. 2078. 14th February, 1953.
 52. Fishing News No. 2268. 5th October, 1956.
 53. Report on the Present State of Knowledge with regard to the Habits and Migrations of the Mackerel. E.J. Allen. J.M.B.A. Vol. V. 1897.
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CHAPTER 8

SHELLFISH - LANDINGS AND THEIR DISTRIBUTION, AND THE MAIN FISHING GROUNDS

It has already been pointed out (Chapter 1) that shellfish play a considerable part in the fisheries of southern England. The many types caught include crabs, lobsters, crawfish, oysters, escallops, prawns, shrimps, cockles, mussels, periwinkles and whelks, but the first four normally comprise about 90% of the total by value and the others, although widespread in occurrence, have more than local significance in few places.

The limitations of the official figures* make the assessment of the relative importance of the various types extremely difficult but, according to the information available, crabs have usually been of greatest importance (Table 36). In practice, lobsters may often have been more significant because almost certainly a greater proportion is sold through unofficial channels.

In Table 36, values have been used, as this is the only way in which a meaningful comparison between the landings in any year of different types of shellfish may be made. Owing to the fluctuations in the value of money, it would be unrealistic to suggest that all trends evident from the statistics represent changes in catches, but the recent increase in landings of crawfish is clearly shown and the decline in values of catches of oysters is largely a reflection of the failing fortunes of the fishery from Whitstable.

* Many shellfish, and particularly those which are financially most attractive, are disposed of privately and no record of the quantity or value of these sales is available.

TABLE 36Value (£000) of Principal Shellfish Landed
in Southern England

	<u>Crabs</u>	<u>Crawfish</u>	<u>Lobsters</u>	<u>Oysters</u>	<u>Total</u>	<u>% Total Value all shellfish</u>
1946	109.2	7.8	65.3	67.1	249.4	93
1949	107.8	10.8	66.7	97.2	282.6	90
1952	80.9	9.5	42.7	86.9	220.0	88
1955	80.1	9.2	73.4	75.7	238.4	89
1958	90.7	12.3	69.2	82.0	254.2	94
1961	82.2	8.2	72.1	44.2	206.7	88
1964	86.4	42.4	89.7	37.6	256.1	87

Source: Derived from detailed figures made available
by Statistics Department, Ministry of
Agriculture, Fisheries and Food.

The total value of shellfish landed annually in the region has fluctuated but was generally at its highest level in the late 1940's (Table 37(a)), although a marked resurgence was evident in 1964. A more realistic picture of the scale of the changes is given in Table 37(b)) where the figures have been modified by an index of retail prices.

TABLE 37Total Value (£000) of Shellfish Landed
in Southern England

	a) <u>Actual Values</u>	b) <u>Values modified by a Retail Price Index (1947 = 100)</u>
1946	268	268
1949	314	283
1952	251	184
1955	268	180
1958	272	163
1961	234	133
1964	294	152

Notes:

1. The figures under (a) have been derived from the detailed figures provided by Statistics Section, Ministry of Agriculture, Fisheries and Food.
2. See notes applicable to the Retail Price Index in Table 10.
3. The Interim Index of Retail Prices was not available for the years prior to 1947 but it replaced the Working Class Cost of Living Index. The relationship between the figures for 1946 and 1947 was determined by using this Index.

Trends in the landings of each of the main types of shellfish are shown in Table 38. It is unfortunate that the figures for crabs, lobsters and crawfish before 1954 cannot be compared with the subsequent ones but some patterns are clearly discernible. In 1952, landings of all types were lower than in 1949 but, with the crustaceans,

this was probably largely due to the effects of a plague of octopus in the Channel in 1950^{1 3} and 1951;^{2 3} the cephalopods were eating the fish out of the pots and leaving only the shells.² After 1955 the generally declining trend continued for lobsters and oysters, but catches of crabs increased until 1958, after which they, too, were reduced and a nadir of 12,000 cwt was attained in 1963; in the same year, catches of lobsters only amounted to 2,000 cwt.

Subsequently, landings of crabs and lobsters have recovered somewhat while those of crawfish have been at a remarkably higher level. Greater shellfishing effort in Cornish waters was largely responsible for the changes and the growing popularity of skin diving as a method of prosecution has played a considerable part in increasing the number of crawfish brought ashore, although the tendency by some fishermen to leave tangle nets in the sea for a longer annual period has had some effect;* since 1963⁴ landings of crabs have increased largely because of the development of an export trade in spider crabs.**

Table 39 gives details of landings of some other types of shellfish and, except whelks, they are now all caught in considerably smaller quantities than before 1950.

* These "tangle nets", which are suspended in the water, have large meshes and are set loosely; the intention, as their name implies, is that fish, particularly ray, crabs and crawfish, after touching the net, become entangled in their struggle to escape.

** Although it is not mentioned in the Report the fish are exported to France.

TABLE 38Details of Catches of Principal
Crustaceans in the Region

	<u>Crabs</u> <u>000's</u>	<u>Crawfish</u> <u>000's</u>	<u>Lobsters</u> <u>000's</u>	<u>Oysters</u> <u>000's</u>
1946	724	26	309	4,261
1949	759	47	324	4,880
1952	562	24	201	4,676
	<u>000 cwt</u>	<u>000 cwt</u>	<u>000 cwt</u>	<u>000's</u>
1955	15.1	0.6	3.5	4,042
1958	17.8	0.6	2.8	3,985
1961	15.0	0.4	2.5	2,126
1964	13.5	1.6	2.6	1,932

Source: Derived from detailed information provided by Statistics Department, Ministry of Agriculture, Fisheries and Food.

TABLE 39Details of Catches (cwt) of
other Shellfish in the Region

	<u>Shrimps</u>	<u>Whelks</u>	<u>Cockles</u>	<u>Escallops</u>
1946	1,114	4,420	4,048	967
1949	3,316	3,476	3,604	781
1952	3,190	5,475	3,834	915
1955	2,562	1,742	744	475
1958	705	2,729	2,174	695
1961	170	3,715	2,019	649
1964	269	3,525	1,746	142

Source: Derived from detailed information provided by Statistics Department, Ministry of Agriculture, Fisheries and Food.

It is not wise to consider the changes in the catches of the principal individual species without reference to the main areas of activity for, with most species, the trends are not consistent in every place. Alterations in regional emphasis have been especially evident with landings of lobsters and oysters and to a lesser extent also with those of crabs. Crawfish, the third of the larger crustaceans caught in British waters, have been landed in quantity only off the coasts of western Cornwall.

Owing to their obvious differences from the other three types of shellfish, oysters may more usefully be examined separately and consequently will be considered first.

The principal oysterages have been in the numerous inlets around the river Fal in south Cornwall and in the Thames Estuary off Whitstable. Smaller numbers have been taken regularly from the Yealm in south Devon, a fishery was started in Poole harbour and a trial laying was made at Emsworth in Chichester harbour;⁵ oysterages also exist at Newtown in the Isle of Wight and at Fowey. An oyster fishery was also started at Saltash in the winter of 1966/67 after a forty-year-old ban on lifting the fish was revoked. Although the fish had been present in quantity,⁶ their removal had been prohibited owing to the degree of pollution in the River Lynher, but after carrying out tests,⁷ scientists from the Ministry of Agriculture, Fisheries and Food voiced the hope that it would be possible to reopen the fishery⁸ with appropriate safeguards and under proper conditions of cultivation⁹ and Saltash Council agreed to the proposal.¹⁰

In this country, most marketed oysters form the end product of a system of fish culture; they are kept in

shallow water in sheltered inlets on private grounds, where they are tended until ready for the table when between four and six years old.¹¹ They are then dredged up and put into cleansing tanks prior to being marketed.

There are also fairly extensive public fisheries, particularly off the coast of north Kent (Fig. 18) and in the Fal and other near-by inlets (Fig. 19). They are in the vicinity of the private grounds and, in recent years, probably have been stocked mainly by oysters which in their youth drifted from these controlled areas. In Kent and in the Fal below a line drawn between Pinarrow Point and Messack Point the common grounds are open to anyone with the necessary equipment to fish them, but the public fisheries higher up the Fal may only be prosecuted by the holders of licences issued by the Truro Corporation which has further stipulated that the vessels used may be powered only by sail or hand-propelled methods; a bailiff is employed to oversee the area.

Two types of oyster grow in waters around British coasts, the better known European flat oyster and the more elongated Portuguese variety; the latter has a different flavour from and fetches a lower price than the flat oyster but has an advantage in that it can be used to exploit the holiday trade, as it may be sold from April to September, which is the closed season for the other type.¹² It has been laid mainly on the Essex coast and to the south of the Thames the numbers have been relatively small. At Whitstable there have been none and the first layings in the Helford river were made in 1957¹² and fish were marketed in 1959.¹³ These oysters "fatten" well in English

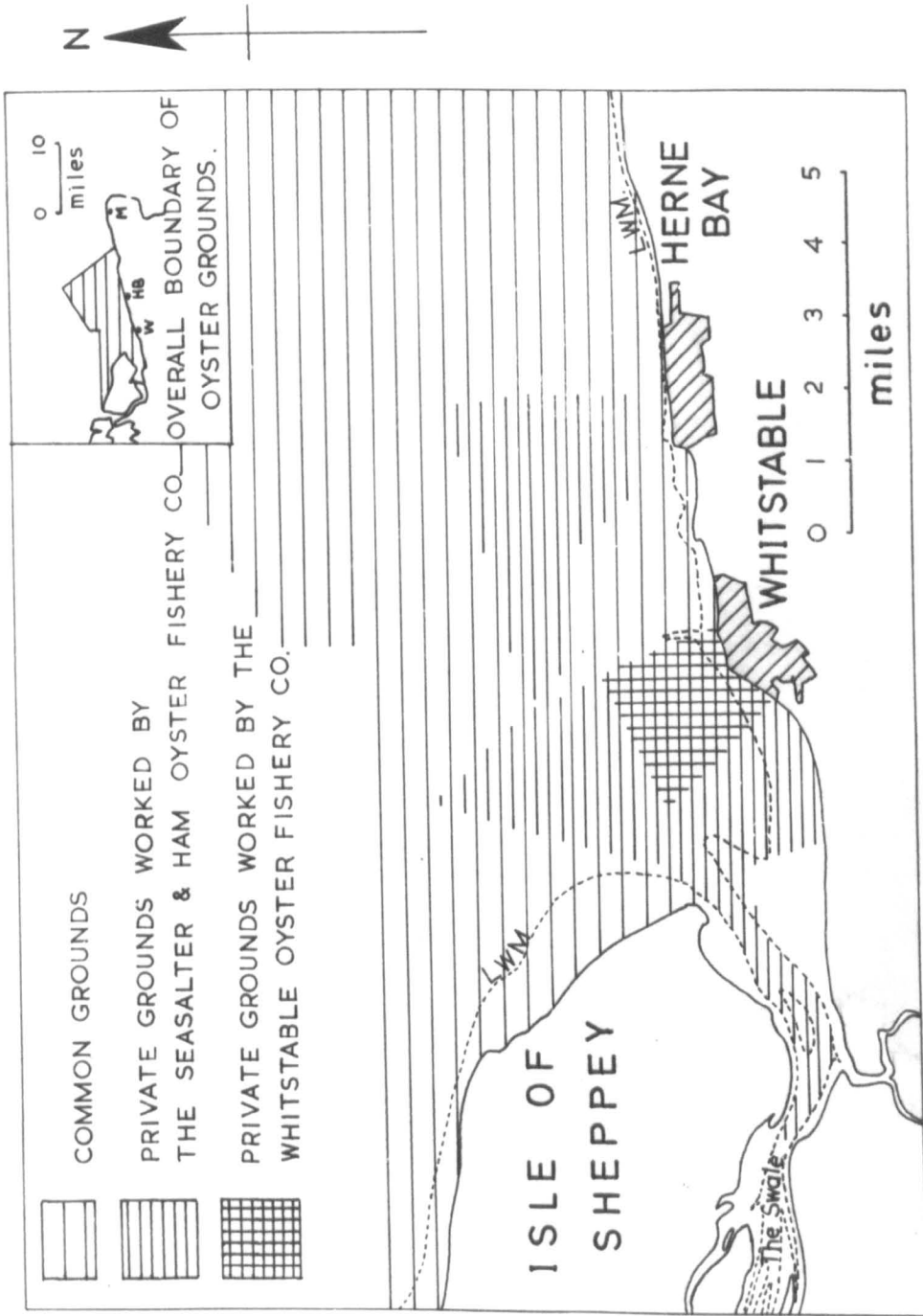


FIG 18. Oyster Beds off the North Kent coast.

waters but spawn there only in exceptionally warm summers as they require a minimum temperature of about 18°C to 20°C to do so.¹⁴

Oysters are usually born between June and August as free-swimming larvae; these float in the sea for between seven and fourteen days before becoming attached, as recognisable oyster spat, to some solid object on the bottom.¹⁵ Tiles or clean shells are often laid to provide anchorages when the larvae settle. The fish are still called spat during the catching season which lasts from September to April in their first year of life. In their second season they become known as brood and are then regarded as one-year old.* In subsequent seasons they are regarded as being two-years old, three-years old, etc.

Good spat falls occur infrequently in English waters and the stocks are made up with oysters which are purchased for relaying mainly from Brittany and Portugal with some from Norway and other countries. Fish from Cornish waters have often been relaid, particularly at Whitstable, where the Seasalter and Ham Oyster Fishery Co. Ltd. obtains oysters from the men who prosecute the public fishery in the Truro river as well as from the private grounds that it rents from the Duchy of Cornwall in the Porthcuel River¹⁶ and rents from private owners on the southern side of the Penryn River.** Oysters are also taken from the Essex coast for fattening on the Kentish grounds.

* By the end of April, a "one-year-old" oyster which was spawned in June would be nearly two years of age.

** The Company took control of the grounds in the Penryn River in 1944.

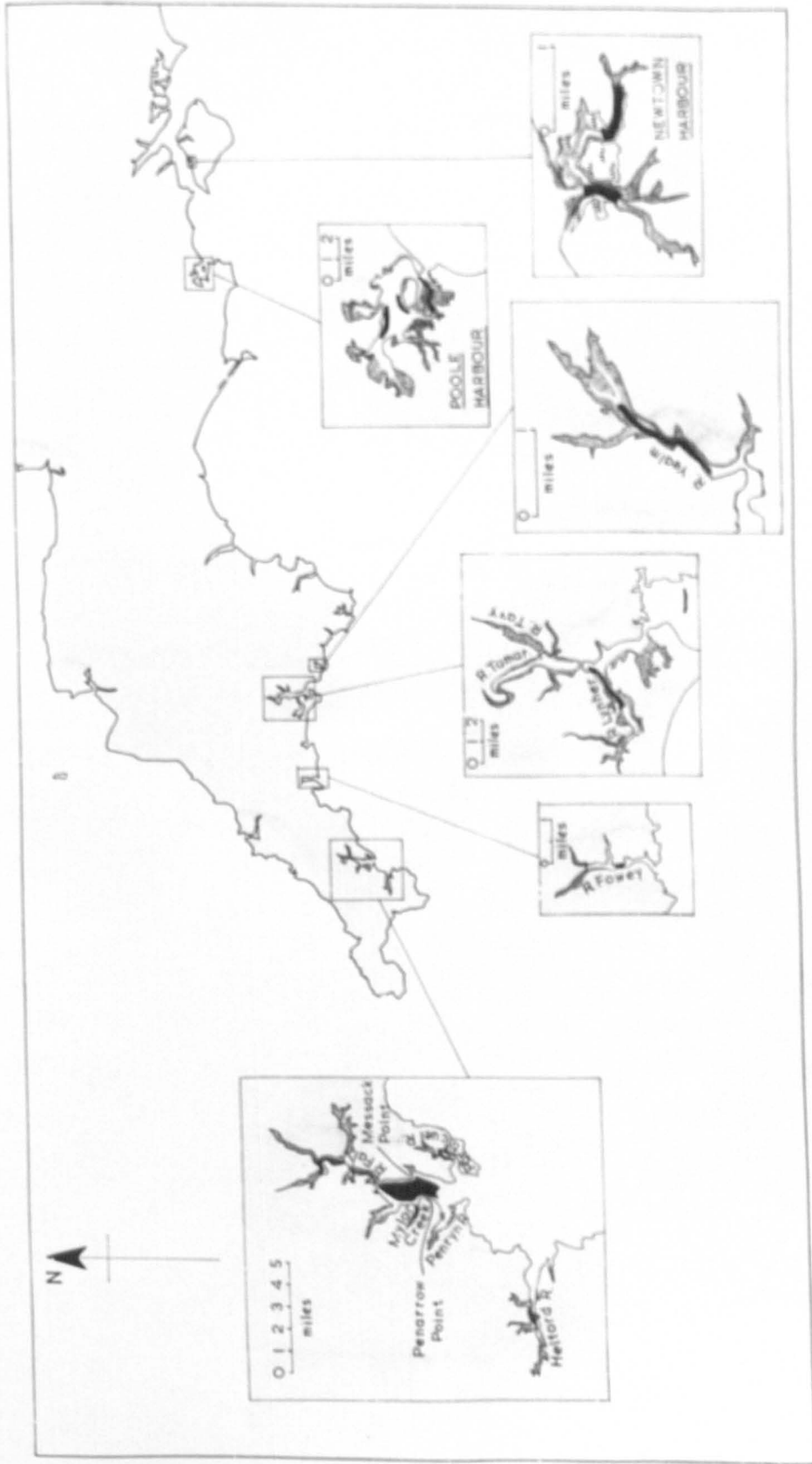


FIG 19 Principal Oyster Beds (shown by solid black shading) along the south coast of England.

The oysterage in the Helford river has been cultivated by Mac Fisheries Ltd. since it was leased from the Duchy of Cornwall in 1921.¹⁷ Pests are few¹⁴ and quantities of spat are collected and relaid. Spat falls, however, are variable and brood oysters are imported, mainly from Brittany. In 1949 Cole commented¹⁸ that "In the Helford River, alone of the British oyster fisheries, is there sufficient stock to give regular spatfalls; it is somewhat ironical that in this river, the fishery depends mainly upon relaid French oysters, which thrive exceptionally, and little attention is paid to the systematic collection and cultivation of home-grown spat." The firm also controls some beds in the Porthcuel. There are other private grounds in Cornwall on the northern side of the Penryn river and in Mylor Creek.

The high cost of oysters from Brittany has encouraged a search for alternative sources. In 1966 the Seasalter and Ham Oyster Fishery Co. Ltd. obtained oysters from the Republic of Ireland for the first time and the Ministry is conducting experiments to examine the feasibility of using stock from Norway,¹⁹ New Zealand and Chile.⁸ Dutch oysters had been imported, but these did not fatten as well as the native stock, possibly because of the change in the salinity of the water between the Ooster Schelde and the British oyster beds.¹⁵ The unsuitability of Dutch oysters was further indicated when experiments in the River Yealm with spat from various sources showed a mortality rate (presumably after one year) of 50% in fish from Holland compared with 10% and 20% in those from France and the River Fal respectively and 15% in artificially raised spat.²⁰

During the 1960's the import of Dutch oysters declined sharply as the beds were destroyed during the implementation of the Delta Plan for south-west Holland.*

Oysters are relaid for fattening at two, three or even four years of age. Younger brood oysters and spat are not popular because losses due to predators and other causes are high at this stage, and although their initial purchase price is low the cost per oyster finally marketed may well compare unfavourably with that of the oyster which has been fattened for a shorter period. Other factors militate against the use of younger fish for relaying; these include the greater liability to major disaster caused by frost, flood or other phenomena with any increase in the period spent around the British coasts. Presumably also the labour costs for tending the beds and clearing them of pests are higher for those containing the more vulnerable small oysters.

Cole states¹⁵ that it is unsafe to assume a mortality rate of less than 30% in three-year-old French oysters upon relaying and suggests that the mortality rate may not be much different in older oysters. He concludes that in general mature oysters transplant badly and that the lowest mortality will be found to occur among two-year-olds replanted in the spring just as growth begins again after the winter.

It is unfortunate that Britain should have to rely mainly upon outside sources for restocking but she is not alone in this respect; in the past Holland has imported from

* The Plan, inaugurated as a result of the storm and flood damage of 1953, involves the closing of the estuaries between the New Rotterdam Waterway and the Wester Schelde, with the consequent inundation by fresh water of the areas where oysters were formerly cultivated. No oysters are marketed at present (1967) but it is hoped to redevelop the industry in the future.

France, France from Portugal and Denmark from several other countries;²¹ this does not make the situation any more palatable, however, for once committed to the use of foreign oysters, the position is almost irreversible until sufficient financial backing is available to allow the building of a large breeding stock. The shortage of young oysters has greatly stimulated interest in systems of artificial rearing; work in progress at the Conway laboratory of the Ministry of Agriculture, Fisheries and Food gives promise of commercial scale production within the next few years.

Many grounds were exploited excessively during the 19th century and, in 1920 and 1921, a major epidemic, possibly caused by a parasite,¹⁴ decimated the oyster stocks of many European countries and had a serious effect on the already depleted British beds. Production of native spat declined and the import of foreign stock provided an early and relatively cheap solution to the problem.¹⁴ This, however, brought its own difficulties, not least of which was the introduction, presumably with oysters from the United States, of the American Whelk Tingle and the American Slipper Limpet, both of which have joined starfish as major pests on many British oyster beds * ** (Appendix 4).

* Under the Sea Fish Industry Act 1962 the Ministry of Agriculture, Fisheries and Food will make grants towards the costs incurred in cleansing and restocking oyster beds affected by pests and diseases.

** The author was informed privately by an employee of one of the larger concerns, that in the Thames the tending of the private grounds is reduced to an absolute minimum and all are responsible for the spread of pests.

Fortunately, the tingle has not yet appeared in Cornwall²² but the limpet was discovered there in 1946.¹⁴

Further setbacks have been provided by cold winters, such as in 1946/1947, when the industry was recovering after the war, and in 1962/63, by floods during the winter of 1952/1953 and by the frequency of poor spatfalls. The situation has been aggravated by the lack of care taken by fishermen to preserve and re-lay the spat that is dredged up when attached to marketable oysters.

After the war the number of oysters taken from Cornwall was considerably in excess of that from the Thames (Table 40) but the latter fishery was soon built-up and, despite the effect of the winter of 1946/1947, by 1949 approximately 60% of the oysters harvested in the region was landed at Whitstable.* This high level of catches at the port was not maintained, and after reaching a post-war annual maximum of over 4 million oysters in 1950, landings declined, until in 1961 less than one million were caught. In 1963 the numbers were reduced still further, following the high mortality rate in the prolonged cold spell of the winter of 1962/1963.

* Many of these oysters had probably been transplanted from Cornwall. Cole had stated¹⁸ that after the winter of 1947, three major companies traditionally associated with the east coast transferred the bulk of their business to Devon and Cornwall while still retaining grounds in Essex and Kent but with reduced staffs.

TABLE 40

Distribution of Landings of Oysters in Southern England
(Quantities in 000's)

	<u>1946</u>	<u>1949</u>	<u>1952</u>	<u>1955</u>
Truro	1,732	Whitstable 3,326	Whitstable 2,605	Whitstable 2,332
Whitstable	1,625	Helford 1,520	Helford 1,939	Helford 1,507
Helford	806	Yealm 33	Porthcuel 86	Porthcuel 189
Yealm	98		Yealm 47	Yealm 14
	<u>1958</u>	<u>1961</u>	<u>1964</u>	
Helford	2,136	Whitstable 960	Helford 1,411	
Whitstable	1,181	Helford 682	Porthcuel 418	
Porthcuel	662	Porthcuel 414	Whitstable 51	
Yealm	6	Yealm 35	Yealm 34	
		Fowey 23	Fowey 18	
		Hythe 2		

Source: Statistics Department, Ministry of Agriculture, Fisheries and Food.

- Notes:
1. The irregular appearance of some of the stations in the Table is an indication of the limitations of the statistics rather than of the vagaries of the fishery.
 2. From 1st October, 1949, the catches from the Truro river are included under the heading "Helford".
 3. The relatively large landings made by the Seasalter & Ham Oyster Fishery Co., Ltd. from Flushing on the Penryn river are not included but between the seasons 1961-62 and 1964-65 varied from about 550,000 to 770,000 per season. (Figures supplied by the Company.)

The Whitstable oyster fishery has proved itself to be particularly susceptible to the effects of adverse weather conditions and pests, but other factors have also been important in contributing to the overall pattern of decline. Perhaps the most significant has been the lack of a firm financial backing which would have allowed the two enterprises at the port to restock when necessary. This problem may well have been overcome by the Seasalter & Ham Oyster Fishery Co., Ltd. which in 1965 became part of the Associated Fisheries organisation. The other firm, the Whitstable Oyster Fishery Co., which is a successor to the Company of Free Fishers and Dredgers of Whitstable and the only business permitted to call its oysters "Royal Whitstable Natives", has been in a much poorer state through the post-war period and indeed was in a similar position before the war. Its financial footing has probably been less stable than that of the other Company, there is only a small full-time staff and no full-time officials and the Company has no layings of oysters in other areas to provide some degree of stability. At present it markets few oysters but obtains lobsters which are kept in tanks at Whitstable prior to disposal.

The Cornish fisheries have not had the severe setbacks that have affected the industry in other parts of the country and even escaped pollution following the foundering of the Torrey Canyon on the Sevenstones in the spring of 1967. They were particularly fortunate during the winter of 1962/63,⁸ and in the following year, when the output from the east coast was drastically reduced, and the maintenance of production from Cornwall enabled the area to contribute almost 70% of the English

and Welsh total. In earlier post-war years the figure had usually been between 25% and 45%.

The other oyster fisheries in the region have been of comparatively small importance throughout the period, although the private fisheries in the Yealm and at Fowey have survived despite the fluctuations in their catches. The small laying at Newtown in the Isle of Wight was completely destroyed in the winter of 1963,^{8 23} but the development of a fishery for clams has given a new lease of life to the beds and provided an income for their operator.

The clams are dug in Southampton water at low tide, put into Courlene sacks and relaid in the estuary at Newtown; they remain there for at least a month to be cleansed and are then put into a tank which employs an ultra-violet system for further purification prior to being sold either in France or on the London market. The clam fishery started in 1963 and the shellfish density is considerable. It has been estimated at 100 per square yard and when, in an experiment off Marchwood Power Station, they were dredged at high tide instead of being dug when the water level was low, 20 tons were raised in one week. The origin of clams in this area is uncertain but is probably associated with visiting American vessels in the second world war.*

Attempts to revive the oyster industry in Poole harbour began in 1958.^{24 25} No commercial oyster fishery had been

*All the information concerning the clams was supplied by J.C. Bayes of the Seasalter & Ham Oyster Fishery Co., Ltd.

in existence there since 1919,²⁶ although some experimental layings made in 1951 by the Ministry and a private Company²⁷ met with limited success.²⁸ It is also recorded²⁹ that oysters from a trial planting were marketed in 1955.

In 1958 two companies were formed and oysters from Holland³⁰ and Brittany³¹ were laid. The Poole Oyster Co., Ltd. started with six directors of whom two were Dutch and the other organisation, Oyster Fishermen (Poole), Ltd., was formed by a group of twenty local fishermen³⁰ and by the spring of 1960 was marketing native and Dutch oysters.³² By this time two individual fishermen had taken leases of five acres of Poole Harbour³² and were cleaning the grounds and re-laying Poole natives picked from other parts of the harbour at low water on spring tides; both men still have their leases but only one is operating profitably.

Each of the major concerns built and equipped cleansing tanks and those of the Poole Oyster Co., Ltd. were first in operation.^{33 34} The other company was permitted to use these tanks but as the fishermen also wanted the barnacles to be removed from their fish the arrangement broke down. Even when their own cleansing tank was in operation, they were not enthusiastic about the removal of the barnacles and oysters were sent for purification to the Seasalter & Ham Oyster Fishery Co., Ltd.

The two larger organisations are still in operation, despite setbacks such as the 80% loss in the winter of 1962/63.³⁵ The Poole Oyster Co., Ltd. was on the point of liquidation in the spring of 1965, when it was bought out

by one of the directors, a Frenchman. In an attempt to put the fishery on a stable footing 250,000 Brittany oysters were laid. The fishermen's organisation is still in being but is in the unfortunate position of having insufficient capital to buy new stock.

Since the end of the war the main changes affecting the oyster fisheries have been in landings, and successful alterations of fishing techniques have been few. Methods of cleansing have been much improved during the period and the use of tanks containing circulating water which has been sterilised with ultra-violet light has become widespread since about 1960 and in the region these systems are operated on the Helford and Fal rivers and at Poole, Yealm, Saltash, Newtown and Whitstable. An example of one of the older systems is to be seen on the premises of the Seasalter & Ham Oyster Fishery Co., Ltd. where a process which has been operating since about 1920 with water filtered through sand and charcoal functions alongside the newer ultra-violet installation. At the Helford oysterage until 1948 the method was to add chlorine to the cleansing water, subsequently tanks were installed to hold circulating water purified with ozone. In 1959, this was superseded by the present ultra-violet system.

The fishery for the larger crustaceans is more widespread than that for oysters, but regional differences have been apparent throughout the period. The greatest overall concentration has been in the waters around the south western counties of Devon and Cornwall and crawfish, the most limited of the group in the areas of their occurrence, have been caught almost exclusively to the west

of a line drawn through Padstow and Falmouth.

Lobsters have been caught in quantity over a wider area than have the other two but nevertheless about one third of the total catch has usually been made in Cornish waters and the figure has increased to one half since the recent expansion of the fishery in the north of the county. They have formed what is economically the main part of the shellfish landings at several places in the east of the region. Good catches have frequently been made in the Weymouth-Wyke-Portland area, at Selsey and around the Isle of Wight and also at Eastbourne. It is also noteworthy that they play a greater part in the economy of many more shellfishing centres than do either crabs or crawfish and it can be calculated from the figures in Appendix 5 that during the years shown the ten principal centres were together responsible for landing between 55% and 68% of the total lobsters but the equivalent figures for the ten most important crab centres were 79% and 89% respectively. The percentage of the total crawfish landed annually at the four main places fluctuated between 67 and 91.

All these shellfish have a preference for areas of rocky ground and a close correlation is seen between the areas of maximum catches of one or all types and the regions of rocks as shown in Fig. 20. Within these areas other factors determine which types will predominate.

Most of the shellfish are caught within seven or eight miles of the shore. In Cornish waters lobsters are taken from close inshore up to a depth of about 30 fathoms and crabs are found in most depths up to about 50 fathoms.³⁶

These depths are not generally exceeded elsewhere.

The concentration of crab landings in south Devon is particularly noteworthy and over half of the total catch has usually been brought ashore in the coastal area between Beesands and Plymouth. Moderate landings have sometimes also been made at Brixham. The fish are caught up to about ten miles from the shore throughout this area but the principal ground is the Skerries Bank, which extends from about $\frac{1}{2}$ mile to $4\frac{1}{2}$ miles N.N.E. of Start Point and is up to about 1 mile in width; this area is particularly well situated for the village of Beesands but catches there have nevertheless declined over both of the periods 1946 to 1952 and 1955 to 1964 as the number of boats has been reduced.

The landings at Dartmouth (and Kingswear) and Plymouth have been made by boats fishing the same and near-by grounds. The former centre is almost as conveniently situated as Beesands to the Skerries Bank, and it has the advantage of harbouring facilities, so that larger boats can be sheltered. At least one Beesands fisherman keeps his boat in the Dart. Catches landed at Dartmouth and Kingswear have generally been increasing since the war (1964 was an unusual year and during 1965 landings were over 5,000 cwt.) and although much of the early post-war expansion was coincident with the growth in the number of boats kept there by Browse Bros., Ltd. the later reduction in fishing activity by that organisation did not contract landings for there were additions to the remainder of the fleet.

At Plymouth, the landings of crabs have been of moderate importance by southern standards throughout the period; the centre is well sited in relation to reasonably productive crab fishing grounds but the improved catches of

the late 1950's and the 1960's only occurred because the reduction which affected the trawler fleet until 1963 made many men look to other forms of fishing that could be prosecuted from small boats. It is likely that the opening of the processing plant at Newton Abbot in 1955 had some effect for many crabs have been taken there from the port. Similar considerations have been noteworthy at Newlyn, where the recent growth of crabbing followed the decline of line fishing and pilchard drifting. The opening locally of the crab picking and freezing plant of Harvey Bros. in the mid-1950's was a contributing factor, possibly an important one.

This relatively high level of crab landings at Newlyn has signified a revival rather than a new development, for there was a short period after the war during which moderate crab landings were made. A similar post-war decline also affected Looe, but this port with its greater interest in the tourist trade, has experienced no recent resurgence.

Landings made at Porthleven and Cadgwith have fairly consistently been among the largest in the region, although apart from the immediate post-war period they have been small by absolute standards. At both places, the survival of the industry probably reflects their ability to offer rather better shelter than elsewhere in the vicinity and also the relative nearness of crab fishing grounds.

The harbour at Porthleven is small and opens to the south-west. There is a bend approximately half-way along its length so that the upper part is aligned roughly north-

south and, with the aid of a wall across the harbour near the bend, is well protected. Although a large area becomes dry at low tide its sheltering advantages together with the proximity of the crab grounds may have assisted in retaining the shell fishery, though operations for wet fish have declined almost to nothing.

In recent years, the stabilisation of crab landings has been helped in no small way by the Wykeham organisation, which took over the port in 1961 and started operating its own crab boats and shellfish processing plant.

Cadgwith has no harbour but is situated at the head of a small south-easterly facing cove just over two miles north-east of the Lizard. It is therefore protected from the south-west and is reasonably near to the shellfishing grounds around and offshore from the Lizard.

The most easterly of the more important crab grounds occurs off Portland and is worked by vessels from Weymouth, Wyke and Portland. This area was of small importance for several years after the war, at least partly owing to the restrictions imposed by virtue of its use for military activities.³⁷ There were also many obstructions on the foreshore and in shallow water.^{38 39 40} These must have restricted fishing to some extent although the area within the Borough of Weymouth was fairly clear.³⁸ The small catches may also be partly ascribed to the fact that the fishermen of Castletown, Portland, who had been displaced from their original site by the Naval authorities during the war were not finally rehoused until 1949.^{37 38 41 42} During much of 1946 and early 1947 the bad weather^{37 39 40 43 44} had an adverse effect on catches and losses of gear were

sometimes considerable.^{40 44} But by 1949 potting in the area was regarded as good and indeed the Fishery Officer was expressing fears of the dangers of over-potting!^{45 46} All these factors apply to the fisheries for both crabs and lobsters off this area of Dorset, as no differentiation is made between the species in the reports quoted. However, it does appear from the statistics* that any over-potting which was taking place had its greatest effect on the landings of lobsters, for in 1952 the combined catch of Weymouth and Wyke was shown as being only 8,800 fish but this figure was abnormally low because of the octopus plague of 1950 and 1951 and the 1955 figure was rather higher.**

Changes at other places are more difficult to interpret, particularly as landings at the lower end of the scale are subject to considerable fluctuations. The boats used are smaller than many of those at the more important centres; they carry fewer pots and are unable to operate over such a wide area or in such a variety of weather conditions. The variations in landings are not damped to the same extent as occurs where catches are larger.

When examining the landings in the south of England, it is important to keep them in perspective. This goal may at least be partly achieved when it is appreciated that in 1964 the total value of crab landings at Beesands (and Hallsands) was £20,700 while that at Newlyn was only £3,100.

* See Appendix 5 and Sea Fisheries Statistical Tables.

** The figures for 1952 and 1955 are not strictly comparable but if it is assumed that the average weight of each lobster recorded at Wyke was 2 lb. (and this is probably on the generous side) about 11,600 were landed from there alone in the latter year.

The total value of crabs landed in England and Wales in the same year was £254,600 and the equivalent figure for the south of England was £86,400; the ratio of the national and southern English values has remained approximately the same since the war.

Approximately one-quarter of the landings by value of lobsters in England and Wales is made in Southern England. The figure during the immediate post-war period was nearer one-half and serves to provide a measure of the decline in the relative importance of the fishery, particularly when compared with that on the north-east coast.

Appendix 5 indicates many changes in the distribution of the lobster catches, but owing to the uncertainty of the statistics it is unwise to place over much dependence upon many of these alterations and particularly those affecting the less important centres. One which is clearly displayed and corresponds with known facts concerns the alteration in the emphasis of the fishery in Cornwall. During 1946 the south coast of the county contained five of the ten villages and ports shown in the Table as being in the first rank for lobster landings in the area; by 1949 the number was reduced to two and there were none in the years 1958, 1961 and 1964. After the war, the landings made in the south were larger than those from the west and north despite the good catches at St. Ives. The subsequent decline which set in was universal in its effect but most marked in the south, and by 1961 less than half the lobsters landed in the county were caught in this area (Table 40).

TABLE 40Approximate Quantities (00 cwt) of Lobsters
Landed in Cornwall (excluding Scilly Isles)

	<u>North & West Coast</u>	<u>South Coast</u>
1955	7	8
1958	6	4
1961	5	2
1964	10	2

Source: Statistics Department, Ministry of Agriculture, Fisheries and Food.

The reasons for this decline are probably numerous but over-exploitation after the war may have been an important factor. The reduction in vessels associated with the general contraction in both wet and shellfishing catches led to a low-level of activity and provided an opportunity for the replenishment of stocks. This appears to have occurred on the north coast where the recent considerable upsurge in catches which has accompanied the increase in fishing is indicative of several years of "under-fishing", and although it has been suggested⁴⁷ that the quantity of fish in the area has apparently increased, notably in the Pendeen region, just north of Cape Cornwall, the writer stressed that there had been little fishing there for eight to ten years. The increasing use of echo sounders to establish the whereabouts of rocky areas has also had an important effect⁴⁷ and some new grounds have been discovered*.

* It was stated in the Quarterly Report of the Sea Fishery Officer for Cornwall for the period ending 16th August, 1962 that the echo sounder of the Committee's patrol vessel "Cornubia", had recorded rough ground and shown a new shellfish area near Newquay.

Off the coast of south Cornwall, however, the catches have continued to decline,⁴⁸ the potential has been poor compared with that in the west and north and boats from south Cornwall have fished from several north coast centres. Craft belonging to the Browse organisation operated for many years during the appropriate season for lobsters off the north coast, rather than in the nearer waters of the south Cornish or, indeed, Devonshire coasts. As early as 1952, and prior to the building of the Paignton processing plant, two vessels were fishing from Boscastle when catches off Start Point were poor.⁴⁹

In the early 1950's, it was recorded⁵⁰ that fewer small lobsters were caught off the coasts of north Cornwall than from the southern Cornish and Devonshire shores and the average weight of fish from the south was $\frac{3}{4}$ -1 lb compared with $1\frac{1}{4}$ -2 lb for those from the north. An attempt to explain this state was made by suggesting that lobster larvae, which are floating in their early stages, first touch bottom in the south and this leads to a preponderance of small lobsters there. In the north, where the residual sea-drift is from south to north, the larvae may be deposited on the coast of south Wales and few small lobsters could be expected on the south coasts of the Bristol Channel. The author of that paper admits that this hypothesis leaves an unanswered question concerning the origin of the mature lobsters, for these shellfish are thought to migrate little except seasonally from deeper to shallower water and back.

There are other possibilities which deserve consideration, particularly as they do not assume major migrations by the larger fish. Perhaps the most obvious explanation is that there has been over-fishing in the English Channel, which may have occurred because the stock there was smaller in the first place or the early fishing effort much greater. Lobster tagging experiments carried out in south Cornish waters in 1956⁵¹ and 1957⁵² showed that the rate of exploitation was fairly high but not greater than that which has been observed in other stocks from which a sustained yield has been obtained.⁵ It is also possible that physical conditions off the south Cornish coasts lead to a slower growth rate in lobsters there than of those from the Bristol Channel; it may be significant in this respect that the lobsters off the south coasts were generally taken in shallower water than were those from the north.⁵⁰ One further factor which may have had an effect along part of the south coast is the silting of some grounds in St. Austell Bay by effluent from china clay works. This was reported in 1960 by the Fishery Officer for Cornwall, who felt that it would have an injurious effect upon fishing from Par.⁵³

The reduction in lobster catches that has been evident in the south of Cornwall has affected most areas in the south of England, but at several places catches are shown as increasing for several years after the war. This is to be expected but it is difficult to assess the validity of these indicated rises. It may be noted that Selsey appears to have become suddenly important in the middle 1950's; despite there being bombing ranges in the vicinity in earlier

years,⁴² the main part of the apparent increase is almost certainly the result of the keeping of more accurate statistics, but even now they are open to considerable doubt.⁵⁴

Observations by skin-divers in Cornish waters indicate that at the end of the season crawfish became scarce from the east,⁵⁵ so that it appears that there may be a mass movement to the deeper water of the west or south-west in late autumn (and presumably a reverse movement in the spring), but it must be remembered that for many years the herrings off the East Coast in the late summer and autumn were considered to migrate from north to south, and although there is undoubtedly some southward movement of mature and maturing fish⁵⁶ the major apparent movement was due largely to the appearance of different shoals progressively farther south.

If this hypothesis is correct, the crawfish would seem to differ in this respect from the lobster, which is not thought to perform large-scale migrations. Studies of lobsters off the coast of north Wales showed that "movements of lobsters do not include any well-defined migrations, but appear to take primarily the form of random feeding movements in all directions with the possibility of small onshore-offshore movements in spring and late autumn."⁵⁷ Crabs, and particularly the females, are known to travel over greater distances; there are examples of crabs released off Norfolk and recaptured from the seas off Yorkshire,^{58 59} but most crabs probably cover much shorter distances. It also appears that large crabs move offshore in the autumn and return inshore in the spring.^{58 59}

During the winter months catches of all three types are at a minimum; this is undoubtedly partly the result of reduced fishing effort at this time, but as it is possible that all groups migrate offshore during the winter many fish may be out of range of the smaller boats. A further factor, which is almost certainly important with crabs,⁵⁸ and perhaps also with lobsters⁵⁵ and crawfish,⁶⁰ is the shellfishes' lack of feeding and other activity in the cooler water.

Calculations made from the results of the landings from the Yorkshire crab fishery showed that during the winter months less than three stones of crabs were caught for each 100 pots lifted. In April (of 1962) the figure increased suddenly to eight stones per 100 pots and the yearly regularity of this change suggests that it is related to a rise in temperature.⁵⁸

During 1954 it was shown⁵⁰ that in Devon and Cornwall the highest total landings and landings per 10,000 pot-hours occurred in June and July (Table 41), but the significance of the relatively large catch of lobsters per unit effort in February is doubtful, particularly as the total figures involved are small. They should not, however, be dismissed out of hand, and comparison with relevant figures for other years could serve to establish or disprove their validity. It is quite reasonably suggested⁵⁰ that the low percentage of berried lobsters (i.e. those carrying spawn) present in the catches during July and August is indicative of the period of maximum spawning activity.

TABLE 41

Seasonal Distribution of Lobsters caught in
selected places in Devon and Cornwall during
February - October 1954

<u>Month</u>	<u>Pot-hours</u>	<u>Total Lobsters</u>	<u>Lobsters/ 10,000 pot-hours</u>	<u>% Lobsters carrying spawn</u>
February	5,040	28	56	10.7
March	191,784	878	46	9.3
April	405,960	1,435	35	14.3
May	880,416	3,529	46	8.8
June	1,032,768	6,979	68	8.5
July	1,034,640	6,441	62	4.1
August	931,872	5,154	55	4.1
September	335,208	1,283	38	6.1
October	3,600	4	11	N.K.

It has already been shown that other types of shellfish have been of relatively small importance in the region since the war, but in order to present a more complete picture it is reasonable to make brief mention of these minor shellfisheries.

Until the mid-1950's, the fishery for pink shrimps was the most important of the lesser activities. It has been conducted almost entirely by trawling in the Thames Estuary and on the southern side the principal centres have been Rochester and Gravesend. In 1948, 17 vessels were fishing from Gravesend⁶¹ but by 1961 the number was reduced to only two, both of which were fishing only part-time.⁶² The fish had become scarce⁶² and as by 1961 vessels were compelled to work mainly abreast of Southend the journey from Gravesend was making the fishery a poor economic undertaking.⁶¹ The reasons for the scarcity are not known and while it has been suggested that pollution might be a cause,⁶² this is not by

any means certain,⁶³ particularly as the landings off the Essex and Suffolk coasts increased after 1962 following several years of poor catches.

Prawns have been of much smaller importance than shrimps. They have been caught in pots and nets in many places around the coasts from Kent to Cornwall. The total catches have generally been small but they have been markedly reduced for several years after particularly hard winters. It was not until 1966 that the fisheries showed signs of improvement following the winter of 1962/63.

Escallops are caught around our coasts in a wide range of depths usually between 10 and 30 fathoms.⁶⁴ They have been taken in several areas of the English Channel and the main fishery has occurred in Devonshire waters, particularly from Brixham, but also in some years from Plymouth, Budleigh Salterton and other places. The grounds are widely scattered (Fig. 21) and occur between twelve and fifteen miles south-east of Berry Head, from about three to five miles south-east to south-south-east of Exmouth, in the Salcombe Estuary, to the south of Start Bay, just east of Beer Head, around the Eddystone, just outside the breakwater at Brixham and there is a roughly triangular area extending from about two miles south of Rame Head to a point about five miles further south, to about five miles off Fowey.⁶⁵ The quantity of escallops taken from these areas is usually determined by the available market, which in this country is small but in the winter (which is the fishing season) of 1966-67 there was a significant export to France to restock beds off Brest.

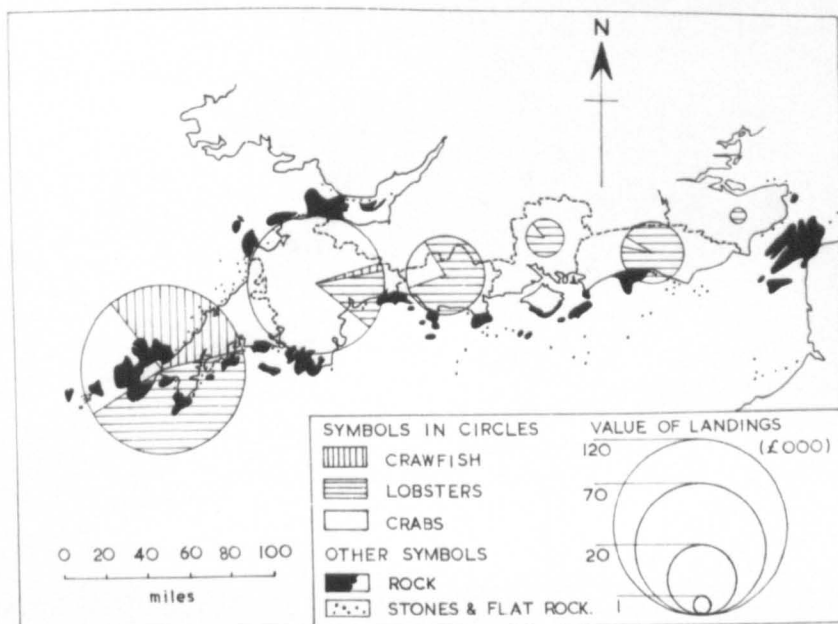


FIG 20. Value of landings by counties of Crabs, Crawfish and Lobsters in 1965 and distribution of rocky areas in southern England.

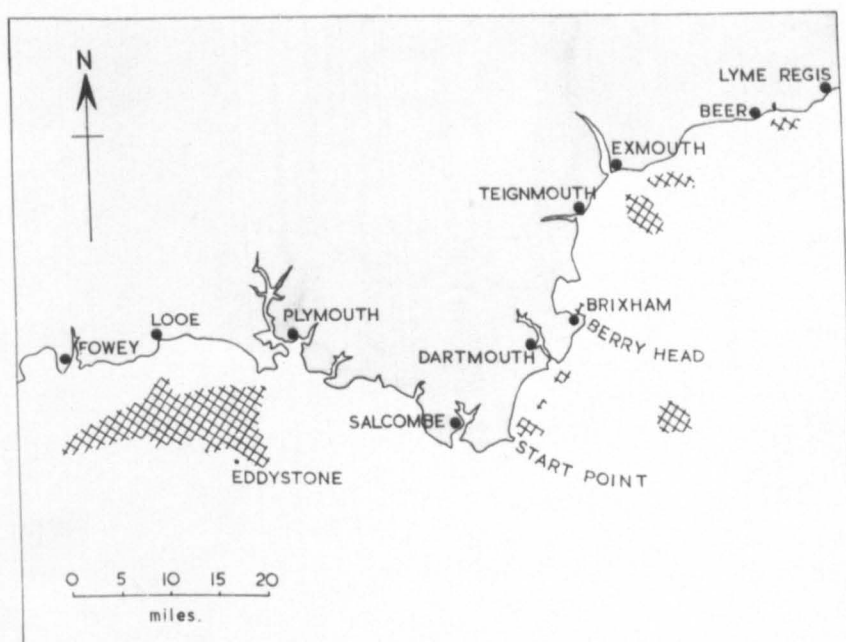


FIG 21 Location of Escallop beds off Devon & Cornwall.

THE ONLY OTHER AREA WHERE CATCHES OF THESE CREATURES HAVE BEEN SIGNIFICANT SINCE 1945 HAS BEEN ABOUT 6 TO 20 MILES OFF ROTTINGDEAN IN SUSSEX.

The only other part of the Channel where escallops have been exploited in quantity has been off Newhaven in Sussex, where the beds are between about 10 and 20 miles out to sea.⁶⁶ This area has been fished more intensively by the French^{67 68} but, following surveys carried out by scientists of the Ministry of Agriculture, Fisheries and Food in the early and middle 1950's, moderate landings have been made by British vessels during the period 1957-1959. After 1960 the fishery faded but in 1961-1962 one vessel from the Isle of Man fleet fished successfully for the season out of Newhaven.⁶⁹

Whelks, cockles, periwinkles and mussels have all been of significance in a few places in the area. The principal whelk fishery has been conducted from Whitstable, where catches are at a slightly lower level than they were shortly after the war. The other whelk fisheries, which have been small by comparison, have been conducted at many places, particularly in the south-east, which have included Ramsgate, Margate and Folkestone.

Cockles, periwinkles and mussels are all taken mainly from tidal inlets but periwinkles and mussels may also be collected along rocky shores. The largest quantities of both winkles and cockles have been taken from Chichester Harbour at Emsworth, but they are also obtained at many other places. Among these, Poole, Lympstone and Teignmouth may be mentioned for winkles, and Poole and, until the winter of 1962-63, Whitstable for cockles.

Mussels have been taken mainly from the rivers of both north and south Devon but there has also been a fishery in Poole Harbour since 1955.^{70 71} These fisheries differ from

those for the other shellfish of lesser importance, in that there are marked similarities to oyster culture, young mussels being transplanted to start new layings or to revive those which are decaying or have decayed.

Throughout the period mussels have been taken from the Rivers Taw and Torridge, but because of their impurity many have been used for bait and in 1945 they were being sent to the north-east coast for this purpose.⁷² Later the local Health Authority permitted the sale for human consumption of sterilised mussels from the area,⁷³ but in 1961 the fishermen stated that they did not want a cleansing bath, which was necessary if the fish were to be made fit for the table.⁷⁴

Along the south coast the main fisheries have been in the estuaries of the Exe and Teign. In the Exe, the grounds were off Exmouth and Lympstone and the fishery was revived in 1948 when a Mr. V.A. Clarke purchased two cleansing tanks which had remained unused at Lympstone for many years.³ A peak season was reached in 1953-54 but during the next season many fewer mussels were processed and subsequently the tanks have hardly been used. It was felt that the reasons for the decline may have been overfishing, pollution or a combination of the two.⁶⁹ During the 1950's there was another attempt to develop a fishery, this time by the Exe Shellfish Ltd;⁷⁵ after several years of operation the scheme was discontinued in about 1959 as the company found that better mussels could be obtained by dredging in deeper water.⁷⁶

On the Teign, the small but thriving mussel fishery increased in importance following the building of a purification system in 1953.⁷⁷

TABLE 42

Landings (2000) of Shellfish
at Principal Shellfishing Centres

<u>1946</u>		<u>1949</u>		<u>1952</u>		<u>1955</u>		<u>1958</u>		<u>1961</u>		<u>1964</u>	
Hallsands & Beesands	65.6	Whitstable	84.6	Whitstable	67.4	Whitstable	58.0	Whitstable	40.2	Whitstable	32.8	Newquay	29.8
Whitstable	46.3	Hallsands & Beesands	60.1	Hallsands & Beesands	50.0	Hallsands & Beesands	29.7	Hallsands & Beesands	26.7	Dartmouth	32.3	Hallsands & Beesands	20.8
Porthleven	21.0	Helford	20.7	Helford	25.7	Dartmouth	20.1	Dartmouth	24.9	Hallsands & Beesands	17.4	Dartmouth	17.4
Truro	13.9	Porthleven	14.1	Dartmouth	13.9	Helford	17.9	Helford	23.4	Selsey	10.6	Percuel	17.3
St. Ives	11.0	St. Ives	13.8	St. Ives	8.0	I. of W.	17.3	Percuel	13.6	Wyke	10.4	Helford	16.6
Helford	8.1	Dartmouth	12.6	Rochester	4.8	Selsey	12.2	Plymouth	12.7	Plymouth	10.1	Hayle	16.3
Gravesend	6.9	Poole	7.0	Cadgwith	4.3	Wyke	10.2	Wyke	9.7	Weymouth	9.8	Plymouth	15.3
Looe	6.7	Brixham	4.9	Selsey	3.9	Port Isaac	6.6	Selsey	8.2	Percuel	9.7	St. Ives	12.9
Portloe	6.1	Mevagissey	4.6	Wyke and Portland	3.8	Cadgwith	6.6	Porthleven	8.0	I. of W.	8.1	Newlyn	11.5
Cadgwith	5.1	Rochester	4.5	Margate	3.8	Plymouth	5.4	Weymouth	7.8	Helford	7.6	Port Isaac	9.7
Selsey	5.0	Sennen	4.0	Plymouth	3.6	Poole	5.0	I. of W.	7.6	Poole	7.0	Weymouth	9.5
Gorran Haven	4.6	Beer	4.0	Porthleven	3.5	Sennen	4.8	Cadgwith	7.3	Port Isaac	6.3	Wyke	9.4
Other Centres (approx.)	68		79		58		74		82		72		107
Total (approx.)	268		314		251		268		272		234		294

- Notes:
1. Helford includes Truro from 1st October, 1949.
 2. Isle of Wight was not included in 1952 or earlier.
 3. Percuel was not included in 1952 or earlier.

Source: Sea Fisheries Statistical Tables.

To conclude the survey of the changes affecting the shellfish industry a study of Table 42 may prove helpful as the total value of all shellfish at the principal centres is shown. Without attempting to go into detail with the alterations, as this would involve a considerable degree of repetition, it can be seen that only three places, Hallsands and Beesands combined, St. Ives and Helford, appear in the Table for 1946 and 1964. A further direct comparison between 1946 and 1964 shows that the landings in the latter year have a far smaller spread of values, with the main centre, Newquay, having a considerably less valuable catch than was made at Hallsands and Beesands in 1946. A final point to be noted is the growth in the relative importance of "other centres".

1. Fishing News No. 1948. 12th August, 1950.
2. Fishing News No. 1990. 9th June, 1951.
3. The Fisheries of Devon and Cornwall. R.H.C.F. Frampton, Ministry of Agriculture, Fisheries and Food. Unpublished. 1954.
4. Quarterly Report of the Sea Fishery Officer for the Cornwall Sea Fisheries Committee for the period ending 12th August, 1963.
5. Fisheries Notice No. 39. Sea Fisheries Research Notes, 1958. Ministry of Agriculture, Fisheries and Food 1959.
6. Fishing News No. 2634. 29th November, 1963.
7. Fishing News No. 2559. 22nd June, 1962.
8. Shellfish Research and Development Progress Report 1963. Ministry of Agriculture, Fisheries and Food. Unpublished.
9. Fishing News No. 2645. 14th February, 1964.
10. Fishing News No. 2658. 15th May, 1964.
11. Progress - Autumn 1951 (Magazine of Lever Bros. and Unilever).
12. Unilever International No. 9. Autumn 1962.
13. Fishing News No. 2404. Dated 15th May, 1959.
14. Oysters. C.M. Yonge. Collins. 1960.
15. Oyster Cultivation in Britain. H.A. Cole. H.M.S.O. 1956.
16. Fishing News No. 1905. 15th October, 1949.
17. Fishing News No. 2318. 20th September, 1957.
18. The British Oyster and its Problems. H.A. Cole. Rapports du Conseil Permanent International pour l'exploration de la Mer. Vol. 128. 2. 1949.

19. Annual Report of the Director of Fisheries Research, 1965. Fisheries Laboratory Lowestoft.
20. Quarterly Report of Fishery Officer for the Devon Sea Fisheries Committee for the period ending 23rd February, 1961.
21. Personal Communication from Dr. H.A. Cole. 31st August, 1967.
22. Protecting British Shell Fisheries. Laboratory Leaflet (New Series), No. 10. Ministry of Agriculture, Fisheries and Food. 1966.
23. Fishing News No. 2617. 2nd August, 1963.
24. Quarterly Report of the Fishery Officer for the Southern Sea Fisheries District for the period ending 25th September 1958.
25. Quarterly Report of the Fishery Officer for the Southern Sea Fisheries District for the period ending 25th December, 1958.
26. Fishing News No. 2349 dated 25th April, 1958.
27. The Quarterly Report of the Fishery Officer for the Southern Sea Fisheries District for the period ending 31st March, 1952.
28. Fishing News No. 2041. 31st May, 1952.
29. Fisheries Notice No. 35. Sea Fisheries Research Notes, 1955. Ministry of Agriculture, Fisheries and Food, 1956.
30. Fishing News No. 2401. 24th April, 1959.
31. Fishing News No. 2460. 29th July, 1960.
32. Fishing News No. 2446. 22nd April, 1960.
33. Fishing News No. 2435. 5th February, 1960.
34. Fishing News No. 2500. 5th May, 1961.

35. Quarterly report of Fishery Officer for Southern Sea Fisheries District for the period ending 25th June, 1963.
36. Information provided by a former Fishery Officer to the Cornwall Sea Fisheries Committee.
37. Quarterly Report of Fishery Officer for Southern Sea Fisheries District for the period ending 11th April, 1946.
38. Quarterly Report of Fishery Officer for Southern Sea Fisheries District for the period ending 18th October, 1945.
39. Quarterly Report of Fishery Officer for Southern Sea Fisheries District for the period ending 18th July, 1946.
40. Quarterly Report of Fishery Officer for Southern Sea Fisheries District for the period ending 16th January, 1947.
41. Quarterly Report of Fishery Officer for Southern Sea Fisheries District for the period ending 15th January, 1948.
42. Quarterly Report of Fishery Officer for Southern Sea Fisheries District for the period ending 7th April, 1949.
43. Quarterly Report of the Fishery Officer for the Southern Sea Fisheries District for the period ending 17th January, 1946.
44. Quarterly Report of the Fishery Officer for the Southern Sea Fisheries District for the period ending 17th October, 1946.
45. Quarterly Report of the Fishery Officer for the Southern Sea Fisheries District for the period ending 20th January, 1949.

46. Quarterly Report of the Fishery Officer for the Southern Sea Fisheries District for the period ending 21st July, 1949.
47. Fishing News No. 2581. 23rd November, 1962.
48. Table 40 and Quarterly Report of the Sea Fishery Officer for Cornwall. 1st February, 1962.
49. Quarterly Report of the Sea Fishery Officer for Cornwall. 29th May, 1952.
50. An Analysis of Devon and Cornwall Lobster Fishermen's Logs. March/October 1954. Laboratory Leaflet No. 5. Ministry of Agriculture, Fisheries and Food. Unpublished. 1955.
51. Fisheries Notice No. 37. Sea Fisheries Research Notes, 1956. Ministry of Agriculture, Fisheries and Food. 1957.
52. Fisheries Notice No. 38. Sea Fisheries Research Notes, 1957. Ministry of Agriculture, Fisheries and Food. 1958.
53. Fishing News No. 2453. 10th June, 1960.
54. Information supplied by the District Inspector of Fisheries, Ministry of Agriculture, Fisheries and Food for the South-East District.
55. Information provided by a former Fishery Officer, Cornwall Sea Fisheries Committee.
56. Sea Fisheries - Their Investigation in the United Kingdom. Ed. M. Graham. Edward Arnold 1956.
57. A Contribution to the Bionomics of the Lobster on the Coast of North Wales. Fishery Investigations, Series II, XXIII, No. 7. H.M.S.O. 1961.
58. Yorkshire Crab Investigations. 1962. Laboratory Leaflet (New Series) No. 3. Ministry of Agriculture, Fisheries and Food. 1963.

59. The Norfolk Crab Fishery. Laboratory Leaflet (New Series) No. 12. Ministry of Agriculture, Fisheries and Food. 1966.
60. The Fishery for Crawfish in Cornwall. B.T. Hepper. International Council for the Exploration of the Sea. 1963.
61. Fishing News No. 2494. 24th March, 1961.
62. Fishing News No. 2516. 25th August, 1961.
63. Information provided by the District Inspector of Fisheries for the South-East District.
64. Notes on Escallops. Laboratory Leaflet (New Series) No. 5. Ministry of Agriculture, Fisheries and Food, 1965.
65. Fishing News No. 2756. 1st April, 1966.
66. Fishing News No. 2294. 5th April, 1957.
67. Fisheries Notice No. 32. Sea Fisheries Research Notes, 1952. Ministry of Agriculture, Fisheries and Food, 1953.
68. Fishing News. No. 2064. 8th November, 1952.
69. Fishing News No. 2540. 9th February, 1962.
70. Quarterly Report of the Fishery Officer for the Southern Sea Fisheries District for the period ending 31st March, 1955.
71. Fishing News No. 2169. 20th May, 1955.
72. Fishing News No. 1669. 17th March, 1945.
73. Fishing News No. 2280. 28th December, 1956.
74. Fishing News No. 2493. 17th March, 1961.
75. Quarterly Report of the Fishery Officer for the Devon Sea Fisheries Committee. 25th February, 1957.

76. Personal Communication from D.R. Edwardes-Ker. 20th September, 1967.
77. Fishing News No. 2112. 10th October, 1953.
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CHAPTER 9

MARKETING AND DISTRIBUTION OF FISH

Since the period immediately following the war, few changes have taken place to the overall channels of distribution for wet fish. Within these, however, fundamental changes have occurred.

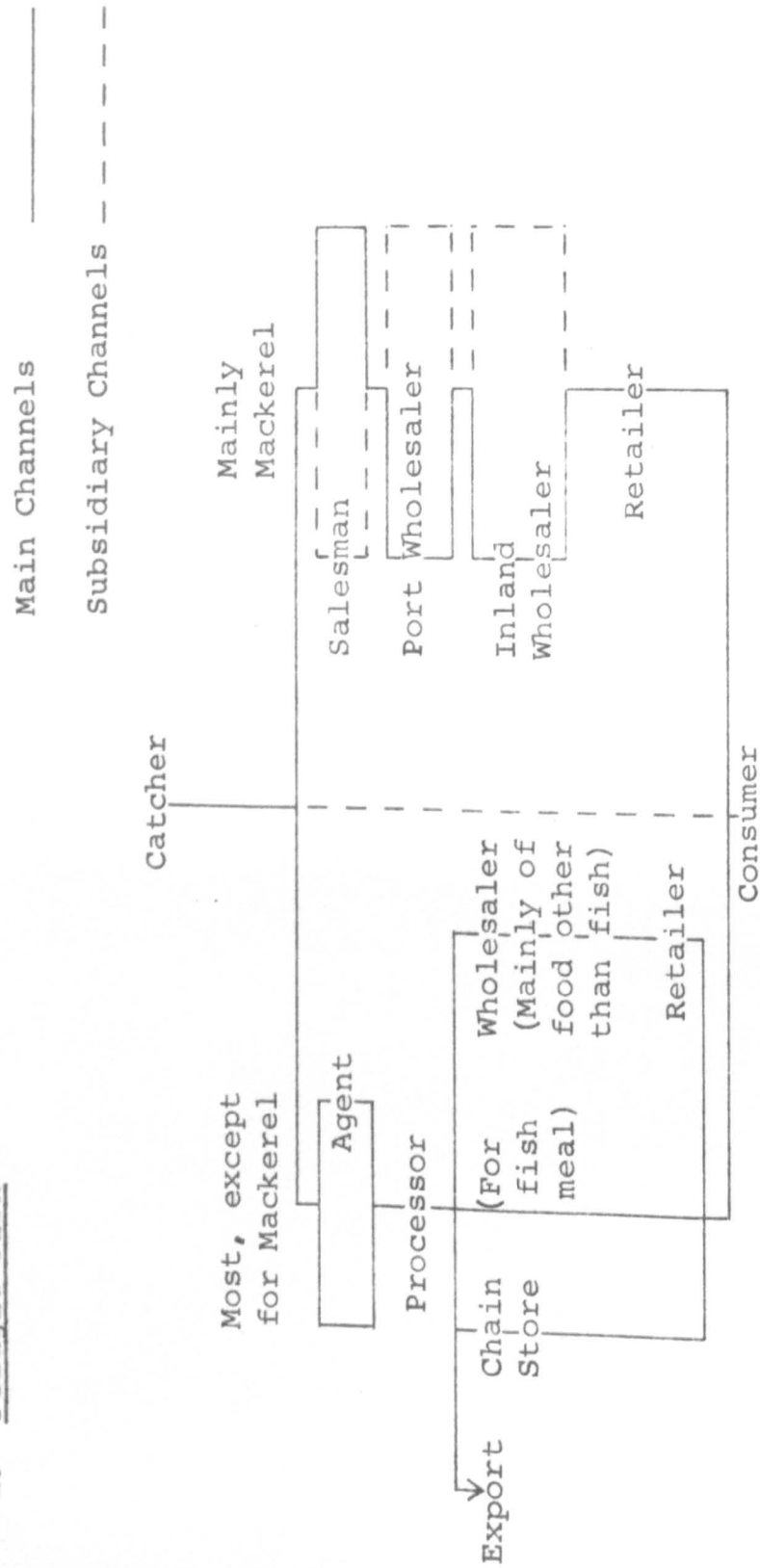
The principal marketing avenues at present in use are shown in Fig. 22.

Within the pelagic group the major changes have occurred at the processing stage. This has been so particularly with pilchards, which at first were mainly cured in brine for export but this is now a minor outlet and most are canned for home consumption, although overall the processing of pilchards has seriously declined. Sprats have been taken for canning throughout the period but the opening in about 1957 at Topsham, near Exeter, of a salting and smoke-curing plant provided an additional conveniently situated market and the arrangements made for surplus sprats to be taken for fish meal and pet food manufacture has eased the problems associated with the disposal of gluts.

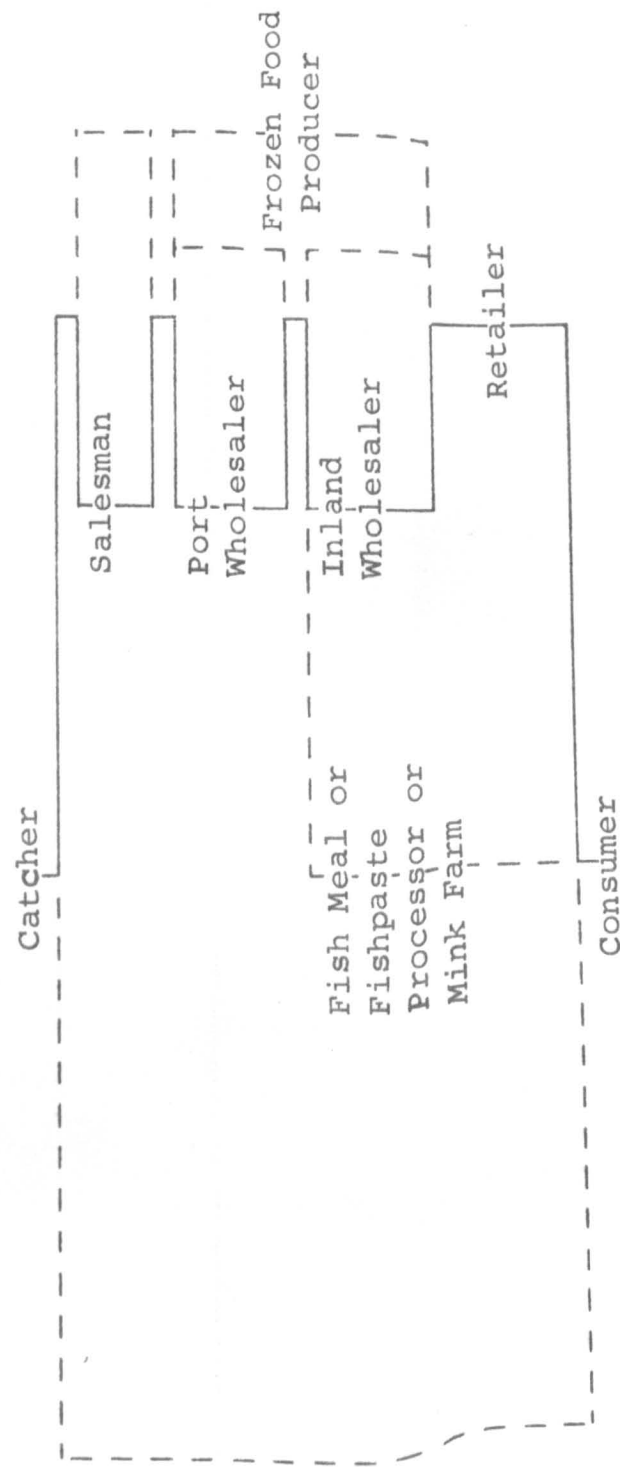
The distribution structure for demersal fish has been changed slightly by the addition of the frozen food producer to take surplus high quality fish from some south-eastern ports and of the fish paste processors and other receivers of excess cheaper fish, from Newlyn, Brixham and Plymouth. It is the general contraction and rationalisation of the industry which has had the greatest effect, however, not by making any fundamental alterations in the procedure but by causing a reduction in the numbers of fish salesmen, wholesalers and markets in the region.

Fig. 22 DISTRIBUTION METHODS FOR WET FISH

a. Pelagic Fish

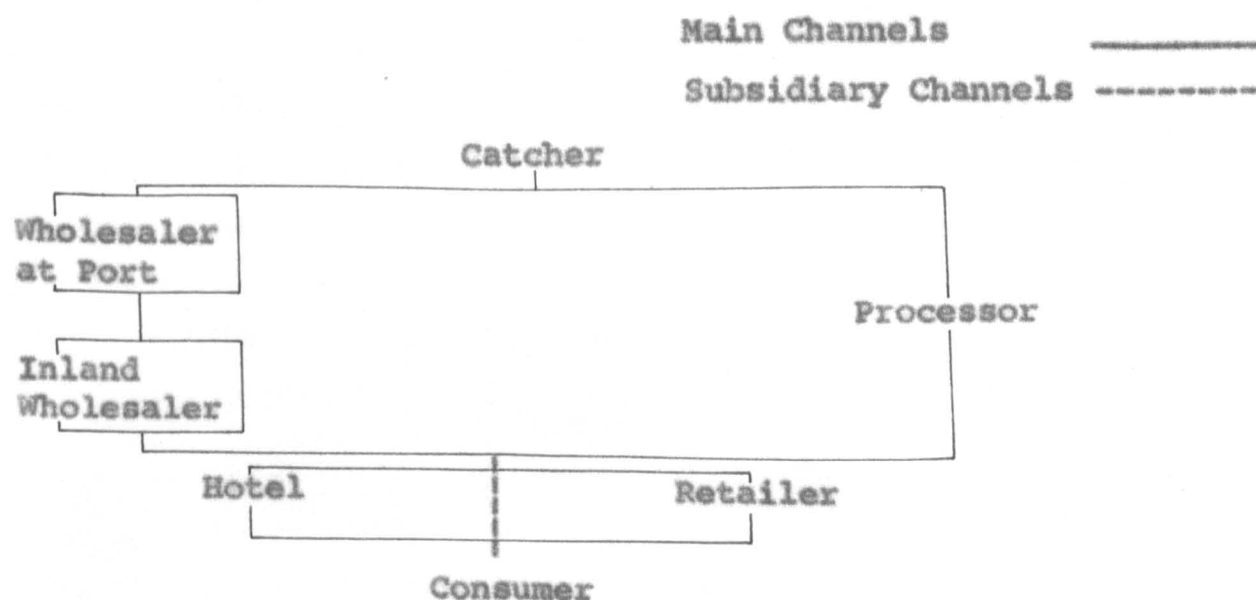


b. Demersal Fish



The distribution methods for shellfish have generally differed markedly from those for wet fish, although many pass through the hands of wholesalers both at the coast and at Billingsgate prior to retailing. A large proportion of lobsters is sold by private arrangement between the fishermen and hoteliers, fishmongers and private individuals (Fig. 23). This latter form of sale has been common throughout the post-war period but may well now be of smaller importance than in earlier years because of the increase in the size of some of the individual catching units and the consequent greater degree of organisation within the distributive chain. The development of integrated firms catching crabs and processing and marketing crabmeat has caused a break from the less formal distributive pattern, as has also the establishment of organisations which have installed lobster and crawfish storage tanks using circulating salt water for keeping the fish alive prior to distribution at the most suitable time.

Fig. 23 DISTRIBUTION METHODS FOR MOST SHELLFISH



It is proposed to examine the changes in greater detail by investigating:

1. Methods of processing and marketing in the 1960's.
2. The methods of processing and marketing immediately after the war.
3. The changes in processing, marketing and distribution between 1946 and the early 1960 s.

1. Methods of Processing and Marketing in the 1960's

There are fish markets both at the coast and inland; most demersal fish and some pelagic and shellfish are sold initially at the port markets and some are then consigned to inland markets, where with fish from other ports and other larger inland markets they are disposed of mainly either to wholesalers or to local fishmongers. Some markets, although geographically port markets may, because of the relatively small quantity of local fish sold there, be put into a similar category to inland markets; Portsmouth is an example of this type. At Brighton and Plymouth the markets can reasonably be put into both categories, as significant quantities of local fish* and of fish brought from the northern ports are sold. The main port markets are at Newlyn, Brixham, Folkestone and Hastings.

In the larger markets of the region, auctions are held where the local fish and those brought by road from the near-by ports are disposed of by salesmen who may also be vessel owners or their employees. Unless they are disposing

* Only small quantities of fish are landed at Brighton, but virtually the entire Newhaven catch is sold there. Considerable quantities are also taken from Dungeness and other centres.

of their own fish these salesmen take a commission which generally is not more than $7\frac{1}{2}\%$. At Brixham and Newlyn the principal trawling concerns of Brixham and Torbay Fish Co., Ltd. and W. Stevenson & Sons, Ltd., respectively sell their own fish and also some for other fishermen; one of the trawler owners at Plymouth is also a salesman. The buyers may be local wholesalers, fishmongers or hawkers. The wholesalers distribute their purchases among various clients, who may be retailers, either local or in another town, or wholesalers at an inland fishmarket.

When Brixham and Torbay Fish Co., Ltd. bought out Torbay Trawlers, Ltd. for about £30,000 in 1965, it took over the marketing function of the former Company by selling the Brixham fish and becoming the principal buyer. The other buyers who are retailers from the near-by area, take only a small proportion of the fish and most of the remainder is sent by rail for disposal in various parts of the country. Prior to the formation of the Co-operative the fishermen had often felt discontented with the prices they received; they feared that Torbay Trawlers Ltd., being the only important buyer, was exploiting its position by not giving fair prices. The validity of this is difficult to confirm; prices for fish at first sale were certainly often higher at Plymouth, but Brixham does not have such a large local consumption of fish. There were instances when unsaleable fish were bought from the fishermen and dumped at sea.

At Newlyn, too, the fish purchasing has for many years been mainly in the hands of one concern, Suttons (Cornwall) Ltd., who use refrigerated lorries to take their fish to

Billingsgate. The two other wholesalers who regularly buy lesser quantities of fish on the market have only a small effect upon prices. Suttons have not been salesmen, however, and this function has been performed principally by W. Stevenson & Sons, Ltd., who have disposed of their own and other fishermen's catches. Again there has been discontent because of the limited market, and Stevensons decided to by-pass the local auction with some of their fish. In 1966 they purchased three lorries and have subsequently been taking fish by road to London. This has had a rather wider effect in raising prices at first sale than might be imagined; Stevensons have obviously been obtaining higher prices but because Suttons have had to compete in the buying at a larger number of ports they have found it necessary to pay more in order to keep an adequate quantity passing through their hands. They had previously been buying from St. Ives under contract, however, and had also taken fish from smaller ports and paid the current market price to the fishermen.

Other wholesale merchants make similar arrangements in the south-west but some of the fishermen at the less important ports arrange for their fish to be sold on commission through an agent. At Mevagissey, the transport co-operative formed during the winter of 1965-66, purchased a lorry to take the fish to Newlyn where arrangements were made with Suttons for its disposal. This action followed the retirement of the last fish merchant at Mevagissey where there were three until 1961 and two until the following year.

At Brighton and Plymouth, where there is a relatively large population near at hand, insufficient local fish is usually marketed to allow much to be sent to inland markets; consequently wholesalers buy little there and the main customers are the local fishmongers. During the summer there is little spare fish on Hastings market, where the only salesman operates an auction for about forty hawkers and a further twenty fishmongers. The hawkers find a ready market among the holidaymakers but in the winter this outlet does not exist and the salesman sometimes has a surplus which he disposes of either at Billingsgate or to Bird's Eye Ltd. at Lowestoft.

There is only one salesman on Folkestone market; he is a wholesaler as well and there is one other wholesaler who joins the fishmongers from Folkestone and the surrounding towns in bidding. Again, any excess fish is taken to Billingsgate. The fishermen at the smaller ports use a variety of methods for disposal and do not necessarily send their catches to the nearest coastal market, particularly if they feel that they can obtain better prices elsewhere. At Rye, which has been of greater importance in the last few years, the active Fishermen's Society, whose members were dissatisfied with existing marketing arrangements at Brighton,¹ purchased a lorry in 1962² to take fish to Billingsgate, where three or four salesmen act for the Society, and to Folkestone.

The Newhaven fishermen have also been discontented as a result of their transactions at Brighton market although most of their fish is still sold there.³ At the end of 1966 they formed Newhaven (Sussex) Fish and Flake Ice

Ltd. and, like the Rye men, purchased a lorry for taking fish to market. They are icing their fish at sea and, on landing, it is taken to their cold store; from there supplies to the market are regulated in an attempt to obtain the highest prices. Previously fish was taken to Brighton and auctioned, with little regard for the state of the market, as soon as possible after being brought ashore.

At Eastbourne the town's principal fishmongers (Chester Bros.) own the only two boats fishing full-time and either dispose of the fish through their retail organisation or send it by lorry to one of the markets. A similar situation occurs at Hythe, where Griggs (Hythe) Ltd. are local boat owners and fish retailers, and a section of the family markets its own fish. Nevertheless, two other members of the family sell their catch at Folkestone market. At Dungeness, the fish from about half the boats are taken by carrier normally to Brighton market but sometimes to Hastings or Folkestone. Most of the catch from the remaining vessels is sold to a wholesaler at Hythe.

The marketing procedure for pelagic fish is generally rather different from that for demersal fish, as most of the pilchards and sprats and some of the mackerel are taken for processing in one form or another.

Mackerel are in greater demand as fresh fish than are either pilchards or sprats and are sometimes sold and distributed in a similar way to demersal fish. Part of the total catch made from small boats by part-time fishermen during the summer holiday period is disposed of to visitors by unofficial and more profitable methods. This

means of sale is insignificant for demersal fish, which usually are caught by larger trawlers whose movements and landings are more closely controlled.

The large quantities of mackerel landed in Cornwall during the summer inevitably mean that surpluses occur. The accompanying problems are eased as many of the fish are put into deep freeze in Newlyn and released out of season when a higher price can be obtained for them. There have been recent occasions when no outlet for mackerel for human consumption could be found, and in 1963 some men at Port Isaac had to stop fishing until a firm of petfood manufacturers at Newcastle-upon Tyne⁴ agreed to take their catch.

Most pilchards are processed in canning factories, and in the years 1957-1961 a total of 10,000 tons of canned fish was produced.⁵ This is in terms of net can weight and probably represents about 13,000 tons of live fish. Over the same period the total landings of pilchards amounted to approximately 16,000 tons.⁵ The quantity of fish sent to line fishermen (for bait purposes), fish meal manufacturers and individuals selling the fish fresh is therefore small.

Of the three canneries that regularly take supplies of pilchards two are situated at Newlyn and one at Mevagissey. Pilchards are also sometimes taken for canning or curing by Henry Sutton, Ltd. of Great Yarmouth; the firm's own lorries are used for the journey. Shippams, Ltd. of Chichester own one of the Newlyn factories where fish are headed, gutted, and packed into large cans before being transported by road to Sussex for paste manufacture. Prior to the installation of the canning machinery in 1965⁶ the factory was used by the firm for heading and gutting the fish which were then taken to Chichester for further processing. Moderate

landings are made at Looe, which has no cannery and is not well placed for any of the existing plants. Nevertheless, the largest proportion of the pilchards is taken by road for processing by Duchy Cannery Ltd.⁷ at Mevagissey, some are also transported to Newlyn for canning and others are used locally in the season for bait by the line fishermen and shark fishermen.

No method of regulating the supply of pilchards to the canners has yet been devised. Unfortunately the fish have poor deep-freezing qualities so any surplus cannot be frozen for canning later when landings are small. Fish may be held in cold store for a couple of days, but this is of limited advantage.

Obviously the canners have not installed machinery to deal with maximum catches, for it would have been hopelessly uneconomic to have it idle for what would probably have been a large proportion of the time. Nevertheless, all canners have equipment to deal with some excess over average landings and they employ additional labour at peak periods. The under-utilisation of the factories is clearly shown by the statistics of purchases of pilchards at one of them, where, over the years 1960-1962, only one-third of the possible throughput was processed⁸ and the factory probably received no pilchards at all on almost half the working days in each season.⁸

If the canners could obtain regularly a large enough supply of pilchards to operate economically the market could probably be expanded. The imports of canned pilchards, mainly from South-West Africa and the Republic of South Africa,

are large, and in 1965 amounted to just over 11,000 tons. Prices of English pilchards are slightly higher than those of the imported variety, but could probably be reduced if a greater plant utilisation and output could be achieved. The marketing procedure for British canned pilchards is, itself, not above question for the outlets have been small in number even though one of the canneries supplies F.W.Woolworth & Co. Ltd.

In the past, dealing with gluts of pilchards has often been a problem. Many pilchards were cured in brine and the main items of fixed plant required were premises and the necessary tanks. Capital outlay, running costs and depreciation were considerably smaller for processing a given quantity of fish by this method than for canning the same quantity, so plant and equipment for dealing with quantities in excess of the average could be installed and maintained relatively cheaply. Unfortunately, the market for fish processed in this manner, despite a recent increase, has contracted considerably since the late 1940's (Table 43) and all but two of the curing plants have fallen into disuse or been demolished. The remaining firms with the necessary facilities are Messrs. Shippams, Ltd. and J. Edwards Ltd., both at Newlyn; fish have sometimes been taken by road to Great Yarmouth for curing and this was done in the summer of 1963, when pilchards were relatively plentiful at Looe.⁹ The decline in the trade with Italy in cured pilchards has eased recently, but the curers are in no position to purchase large surpluses. The containers for these fish hold 56 lb., 28 lb., or 18 lb. and the first-named is the only type at present in use which was

also employed after the war, when one-cwt. containers were common. The 18 lb. boxes are rectangular in shape (Plate 18) and have only been employed since about 1962, but the other sizes retain the traditional cylindrical form with the fish packed in "star" fashion (Plate 17). There is a market for the 28 lb. size in New York.

The marketing of sprats presents problems which are in many respects not dissimilar from those of marketing pilchards, owing to the seasonal nature of the catches and the considerable variation that occurs in the annual and daily landings of the fish (Chapter 7). Sprats, however, figure more prominently than pilchards in sales as fresh fish and this outlet takes practically the entire catch from the south Kent and Sussex coast, and many of the good quality fish landed elsewhere early in the season (usually before Christmas).

From the principal centres of Whitstable, Torquay, Brixham and Poole sprats are mainly sold for canning and other processing. At Torquay and Brixham they are mainly disposed of through wholesalers and are taken for:

- (a) Fresh market.
- (b) Petfood manufacture.
- (c) Salting and smoke-curing at Topsam and, since the winter of 1965/66, by an East Anglian curer who sends a lorry to Torquay.
- (d) Fish-meal by a Hull factory.

Some of the fish destined for the fresh market are taken by rail, but the fish intended for other uses are taken by road, local transport being used.¹⁰



Plate 17 Cured pilchards in cylindrical containers. In the background fish are being pressed in several casks.

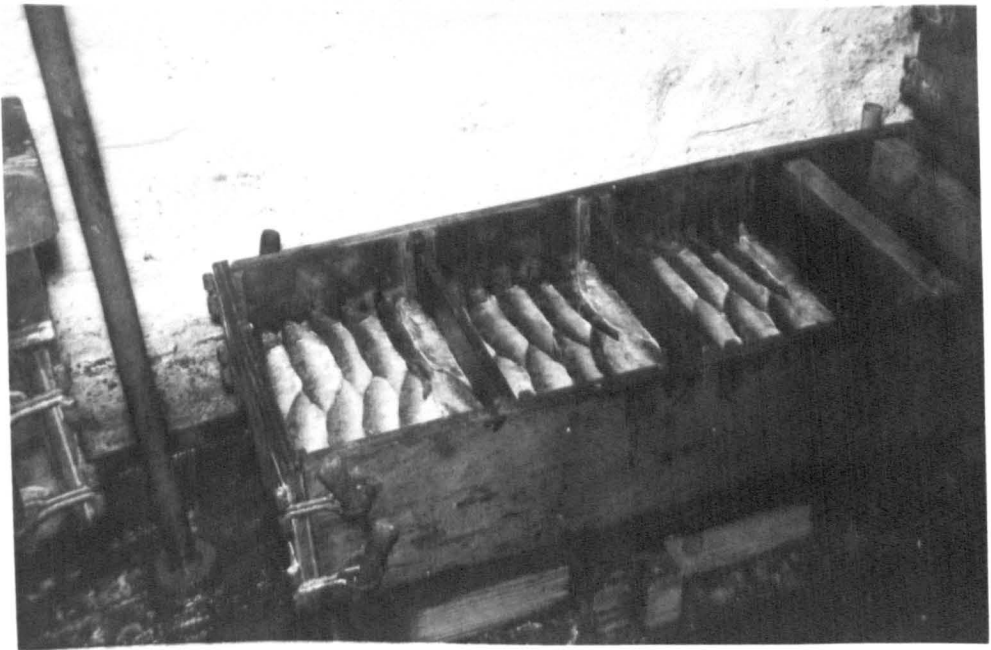


Plate 18 Pressed, cured pilchards before being packed into rectangular boxes.

The sprats landed at Poole are taken by one wholesaler who distributes them in his own lorries. The first catches of the season are mainly sold fresh although the canners provide some competition at this stage. When the canners and fishmongers can take no more, petfood and fishmeal manufacturers provide important outlets. In addition some sprats are taken for smoking, either by the wholesaler himself or by the Topsham firm mentioned above.¹¹

Most of the Whitstable sprats are canned and for this purpose are taken by public road transport to the plant of British Fish Canners Ltd. at Fraserburgh. They may first be taken to a public cold store either locally or on the way north. In 1963, the firm installed in Boston a grading and checking station, through which all fish pass before onward transmission to Fraserburgh.¹² Some are taken to Melton Mowbray for petfood manufacture and, in 1964, there was direct export by carrier vessel from the fishing grounds (page 266).

Unfortunately for the fishermen, the system of subsidies payable on landings made by inshore vessels has been altered by the White Fish Authority during recent years in ways which have been particularly disadvantageous where the catch has not been intended for human consumption. From 1st August 1963 the subsidy of 10d per stone which was paid during the previous year on all sprats landed was increased to 1/- per stone for sprats intended for human consumption but was reduced to 6d per stone for sprats intended for uses other than for human consumption.¹³ There have been subsequent reductions to both amounts on 1st August, 1965,¹⁴ 1st August, 1966,¹⁵ and 1st August, 1967.¹⁶

Other changes have been made in the subsidy scheme since 1st August, 1966, and a rate per quantity of fish landed ("stonage rate") is now only paid on the catches of vessels of less than 35 feet in length or on those of vessels of between 35 feet and 60 feet in length that did not make catches of white fish or herring or both that amounted, or would but for circumstances beyond the control of the owner or charterer have amounted, in the year 1965 to at least £500, or in the year 1966 to at least £300. Other vessels of over 35 feet in length have been paid at a rate per day at sea ("voyage rate"). A high proportion of sprats is landed by craft of less than 35 feet in length and the present relevant stonage rates are 8½d, if the fish are sold for human consumption, and 2½d if they are sold for other uses.¹⁶

The initial stages in the distribution chain for shellfish vary as do those for wet fish, both between ports, and within a port. Very few sales take place through a port auction, however, probably largely because many of the fish are sold live and any delay or superfluous handling might prove fatal to them. Some fishermen supply an inland shellfish merchant directly, but this form of sale has been decreasing in importance.¹⁷ Much of the fishery for crabs and lobsters is on a small scale. During the summer there is a sizeable local demand and individuals with a few fish to dispose of are in a good position to make direct arrangements to supply hotels, restaurants and individuals without causing themselves too much inconvenience; consequently an auction would be of little use in these circumstances. There are, of course,

wholesalers who take shellfish all the year round but, although they are probably the largest overall buyers of shellfish, there are relatively few of them, and they also make individual arrangements with fishermen and by-pass the port auctions.

The wholesalers sometimes provide bait and usually collect the catches by lorry from the ports. They then dispose of some of the lobsters, crawfish and crabs locally, others are exported and many are sent to inland markets and particularly to Billingsgate.

One of the main problems facing fishermen and wholesalers who market shellfish is keeping the fish alive. At the ports the responsibility sometimes lies with the fishermen and sometimes with the wholesaler. If the former condition holds the fishermen put their catch into a wooden chest with holes in it (Plate 19) or a keep-pot, which is similar in design to but larger than the traps used for fishing. These instruments are tethered not far from the beach where they operate and the shellfish keep in perfectly good condition for several days, but losses can be considerable, particularly if bad weather prevents the fishermen from visiting these store-pots for some time. Some wholesalers also keep fish in this way but a number have installed concrete tanks, with plants which circulate, clean and aerate sea water. These can hold larger numbers of lobsters and crawfish. In 1959-1960, a wholesaler at Weymouth installed a tank to hold about 400 lobsters for a few days; this enables him to collect and hold on his premises lobsters bought from outlying fishermen in his area, either to meet the market at a convenient time or until he has collected



Plate 19 Large wooden chest used for storing shellfish.

enough in a slack period to make a consignment to an inland market more economical.¹¹ He obtains sea water off the Chesil Beach and takes it in a trailer to his plant on Weymouth Harbour. In most other instances the water is pumped directly from the sea.

The Southampton firm of Clayton, Love & Sons has much larger lobster storage tanks with 8,000 lb. capacity. The organisation has been established at the port since 1954 but it has recently moved to new premises with tanks having a capacity almost double that of the older ones. Its own lorries are used to collect most of the lobsters from Selsey and also, until 1965, some from the wholesaler at Weymouth. In addition, shellfish are sent from south coast centres as far away as Newlyn and many are brought from other parts of the British Isles and particularly from Scotland. The fish are stored as necessary and then supplied to the liners at Southampton.

Since 1960 the firm has built up a considerable export trade and sends shellfish by air from London and Southend Airports to various continental countries. Cunard liners on "sunshine cruises" collect fish sent out to Nice.

Wholesalers at Billingsgate employ various methods for keeping their fish alive but at least one successfully uses tanks with circulating salt water.

Porthleven Fisheries, Ltd. have storage tanks in the old lifeboat-house and until the winter of 1965-66 there was a plant in operation at Mevagissey; it had been owned by Pawlyn, the local fish wholesaler, before he closed his business.

The Porthleven firm has a good export trade with continental countries in live shellfish. Lobsters and crawfish have often been consigned by air and the company now has an interest in a small plane which is used to take the latter to France from Land's End Airport. Fish have also been sent by sea, either directly from Porthleven in a French "well-boat"* or on the Southampton to Cherbourg car ferry service which opened in 1964. When the car ferry was used, shellfish could be taken from Porthleven to their destination in one vehicle, and this system was generally found to be more reliable than that employing the well-boat which was delayed rather more frequently than the larger craft by adverse weather conditions. Presumably neither of these methods is regarded as favourably as the air transport system now used, although both had been preferred to public air transport which had been used to a considerable extent in the early stages of the Company's operations. Fish for disposal in Jersey have been flown there from Exeter airport, and others are exported through a wholesaler at Hoo in the Isle of Grain, having been taken by road to Kent where they remain in tanks until required.

There is little demand for crawfish on the home market but lobsters are more popular and for sales of these the company deals to a considerable extent with national buyers rather than with wholesalers at Billingsgate, who provided the main outlet a few years ago. This change has been aided by the recent increase in cooking and deep freezing of

* Well-boats are vessels which have a hold (or well) through which sea water flows in order to keep the shellfish in good condition during their journey.

lobsters at Porthleven; such a procedure would have been viewed with suspicion a few years ago.

A much greater proportion of crabs is cooked near the point of landing either by wholesalers or by fishermen, and at several places crabmeat is produced. This is an important part of the work of Porthleven Fisheries, Ltd., who take crabs landed by their own vessels and those of fishermen from Portloe to Mount's Bay and also from Padstow.¹⁸ The fish are cooked, picked,* packed into cartons, deep frozen, and when required the packages are loaded into refrigerated delivery vehicles for transport to London and other areas of marketing. Some have been exported to the continent.¹⁹ Much of the brown meat is taken by fishpaste manufacturers and the white meat by local hoteliers. As the catches of crabs are to a considerable extent seasonal, the firm has provided more consistent employment for its staff and obtained higher plant utilisation by deep freezing Cornish broccoli and cauliflowers during the winter months since the 1964-1965 season. Other attempts at diversification have been made by producing small quantities of marinated "roll-mop" pilchards and tinned crab soup.

The Porthleven crab processing plant, which was opened in 1963, is in many respects a copy of the longer established and larger factory on Paignton harbour, owned by Browse Bros., Ltd. Its main outlets for crabmeat are also broadly similar to those used by the Cornish plant.

There are four other plants in the region using similar processing methods. Two are at Paignton, one is at Newlyn, owned by Harvey Bros. Ltd. the principal shellfish merchant there, and the fourth, the largest of all, is at Stover, near Newton Abbot.

* Picking is the removal of the meat from the shells.

Porthleven Fisheries, Ltd. and Browse Bros., Ltd. can be regarded to some extent as vertically integrated catcher-processor-merchants although both have been reducing the catching side of their activities. The other organisations are concerned solely with the processing and selling side of the business, although they may provide bait for the fishermen and collect their catches from the landing places. The Stover plant, which is part of the Ross Group of Companies, and also processes escallops, obtains its supplies of shellfish mainly from Plymouth, Salcombe and Kingswear, a "price delivered" being paid.

The export of shellfish is becoming increasingly important; the plant on the Isle of Grain has already been mentioned and a similar enterprise has been built up by a Frenchman at South Fambridge on the River Crouch in Essex. The sea water locally is relatively uncontaminated and suitable for use in storage tanks while Southend Airport is conveniently near for exporting fish to France, Holland, Belgium, Germany and Switzerland. The staff of five or six handles four tons of shellfish per week during the season and live lobsters arrive from the West Country, Scotland and Wales packed in wood shavings or sawdust. They are then put into the storage tanks and when required for export they are removed and placed, with a little ice, into cardboard cartons with a capacity of 40 lb. The average loss between first capture and arrival abroad is less than 10%.²⁰

About three-quarters of the crawfish caught²¹ are exported to France. For several years, many have been taken by French well-boat from Newlyn but the short-lived trade with Porthleven did not start until 1964.

Many of the other types of shellfish are disposed of locally, although shellfish such as cockles, mussels and scallops bottled by the Exe Shellfish Company in premises on Exmouth quayside, have a wider distribution; so also have the scallops deep frozen at the Ross Group plant at Stover. Other shellfish sent out of the region include whelks and shrimps from the Thames estuary and the mussels from parts of North Devon which are used on the North-East coast of England for bait by line-fishermen. The recent export of live scallops to France for restocking purposes (page 303) may also be mentioned.

2. The Methods of Processing and Marketing in operation immediately after the War

The period to be considered as that immediately following the second world war must initially be defined. It must not be so long that a large degree of freedom from wartime and immediate post-war restrictions is obtained during it, nor so short that the situation is influenced by the conflict to such an extent that an unrealistic picture of the immediate post-war situation is obtained. The period from the end of the war in Europe until the end of 1946 provides a reasonable compromise.

One of the major differences between the distributive organisation immediately following the war and the present one was the system of controls in operation in the former period but since removed. There were two principal types

of control; the first concerned distribution areas and the second price.

In a free distribution organisation, the size of the hinterland of a fishing port depends upon the cost of transport, the preservation qualities of the fish (which are intimately connected with the time for transport), the degree of enterprise exercised by the salesman and the desirability of the particular type of fish. The distribution control in operation during and for a period after the war was exercised by having a system of zones; the fish from each port were distributed within certain zones and this had the effect of minimising transport costs but also of limiting the variety of fish available in individual zones. There were also unfortunate repercussions when an important port, such as Hull, had small catches. Such a port might normally supply several zones and in these circumstances the zones would all have small allocations.

Under this zoning system inland markets obtained supplies of fish from one or two ports, but Billingsgate acted as a clearing house and supplies arrived there from several ports. When the quantity of fish landed at ports was in excess of the amount allocated to the inland markets, the surplus was sent to Billingsgate. Modification of the zoning system was announced in June 1945²² and the White Fish (Transport) Order, 1945, and the White Fish (Distribution) Order, 1945, were introduced to assist in getting a greater variety of better quality fish to the consumer.²³ Zoning was finally ended on 2nd March 1946 but the allocation system continued.²⁴ This meant that ports were compelled to supply their allocations to certain inland

markets but could dispose of surpluses to whom they wished. Although this freedom was not as great as most wholesalers wanted, it nevertheless meant that old contacts could be renewed.

The control of fish prices was related to maximum and minimum price levels at various points in the distribution chain. The prices were generally reviewed twice a year and, after the war, several successive main amendments brought overall price reductions. To the outsider this did not appear unreasonable, for catches increased as the fishermen got into their stride and more fishing grounds were cleared of wreckage. The fishermen were not so happy, however, and early in 1946 the Cornwall Sea Fisheries Committee was informed that fish prices were little higher than pre-war* whereas gear and boats were considerably more expensive. A 60 ft. vessel, which before the war cost £3,500, was now costing £8,000.²⁵

The first reduction occurred in the summer of 1945 and the next change was during the following winter when some prices fell and others rose but overall they showed a decrease from those prevailing during the previous winter.

It was felt that the Ministry was becoming more realistic in its approach when the summer prices for 1946 were announced. The greater number of categories for fish which were included allowed for more price differentiation among various types and qualities of fish,²⁶ but it was still felt by the inshore fishermen that the prices paid

* The validity of this statement must be questioned for, in 1938, the average value per cwt. at first sale of all wet fish landings in England and Wales was £.79 and in 1946 the corresponding figure was £2.26.

to them were too low and a vigorous protest was made at a gathering at Rye of 160 of them. Fishermen from places as far apart as Rye, Penzance and the Moray Firth were represented and the meeting asked the Ministry:

- (a) To recognise inshore fishing as a separate industry from deep-sea.
- (b) To remove the control from inshore fish (which the fishermen claimed to be superior to imported fish).
- (c) To subsidise the cost of gear and fuel, or else to make a fixed price, in order to stop fishermen being at the mercy of buyers.²⁷ *

Members of the Rye, Dungeness and District Fishermen's Protection Society felt the need of a national federation to fight the government over these alterations.²⁸ They were soon joined by the Brighton Fishermen's and Boatmen's Protection Society and the West Cornwall Fishermen's Council,²⁹ and in the summer of 1946 the Federation of English and

* The reason for the suggestion that the fishermen were "at the mercy of buyers" is a little obscure, but suggests that "price rings" were being formed against the fishermen and prices were frequently near their minimum level. This suggests that the root of the problem was a shortage of buyers rather than the controlled system. It is likely, of course, that the level of the controlled prices was, in the fishermen's estimation, too low; if this was so, the buyers were innocent parties.

and Welsh Inshore Fishermen* was formed of local fishermen's societies, mainly from the south of England.

Many individuals and organisations were putting proposals concerning the composition of controlled prices to the government. Consequently, it is impossible to assess the effectiveness of the Federation in this direction, but the feeling aroused at the time is clearly shown by its very formation.

In the summer of 1946, sprats and pilchards were released from maximum price control and consequently entered a free market.³⁰ A little later in the same year, following the announcement of the prices for the coming winter, a conference was held of representatives of the inshore fishermen of Scotland and England and the Ministry of Food. The fishermen were unanimous in their criticism that the prices were too low. The Ministry officials promised to consider various proposals and it was hoped that concessions might be made with regard to certain classes of white fish which were mainly caught by inshore fishermen.³¹ Subsequently, revised winter prices were announced which allowed increases to the producer on soles (other than lemon), brill and turbot,

* The Federation concerned itself also with problems other than controlled prices. It entered into correspondence with the government over the possibility of acceptance into the Royal Navy of fishermen who were eligible for National Service,³³ and conferred with representatives of the Ministry of National Insurance on the position of share fishermen under the terms of the National Insurance Act, 1946.³⁴ Pronouncements were also made by the Federation in 1947 in support of the adoption of an increased mesh size.³⁵ The body is now defunct after being small and ineffectual for many years; price controls, which were largely responsible for its inception, finished many years ago and the interests of the inshore fishermen are, in the main, well looked after by other bodies, among the most prominent of which are the local Sea Fisheries Committees.

chitlings, melts and roes and mackerel.³²

Apart from the imposed controls, the general distributive organisation after the war was little different from that existing at present. Most of the demersal and some pelagic fish were sold at auctions by fish salesmen and the buyers were either wholesalers who despatched the fish to near-by retailers or to inland markets or were local retailers. Much of the pelagic fish was processed before finally reaching the consumer, and the shellfish was either sold locally or sent inland, perhaps passing through the hands of a local fish salesman but not being sold at a port auction.

The main difference from the present situation was in the number of salesmen and wholesalers at the ports. The fish caught by vessels from several of the smaller ports are now landed at one of the ports with markets or wholesalers or taken overland for sale at one of the auction markets.³⁶ After the war many more small ports had wholesalers who purchased the fish locally. At Mevagissey where there were three wholesalers, none has operated regularly since the winter of 1965/1966 when Pawlyn's closed. This same firm of wholesalers had branches in Newlyn, Plymouth, Port Isaac, Padstow, Newquay and Porthleven and before the war they had been important in St. Ives but as landings have declined the branches in these towns have closed. The number of salesmen at the larger markets was also greater than it is at present; according to information received from the Chief Fishery Officer for the Sussex Sea Fisheries Committee there were nine salesmen at Brighton after the war compared with seven in 1964 and reductions have also occurred at other markets.

Many sprats were sent to canneries, as at present, but there were no pilchard canneries and most of the fish were cured in brine. Vats were in existence at Mevagissey, Newlyn and Mousehole, but there was none in operation at Looe until November 1945, when pilchards were salted there for the first time in six years; Mr. L.E. Middleton of the fish buying firm bearing his name was invalided from the armed forces and made rapid arrangements to re-open his salting pits. Previously, for economic reasons, Looe buyers would not undertake salting and outsiders would not take the risk of losing money by buying surplus pilchards unless they were also granted a licence to sell the more profitable white fish.³⁷

The problems of marketing pilchards were becoming evident very soon after the end of the war. Fish were being processed to help feed the people of continental Europe through the auspices of U.N.R.R.A., but surpluses still occurred, and in the latter part of 1945 the M.P. for south-east Cornwall, Commander Douglas Marshall, was making efforts to find a firm with the capital available to establish a pickling and canning plant.³⁸ Prices paid to the fishermen for pilchards were obviously of prime importance and in the early part of 1946, when the minimum price paid for pilchards for tanking was 2s.0d per stone, it was said that this would provide a wage of only £2.15s.0d per week. This was so low that older men were withdrawing from fishing and their boats were being sold for other purposes. It was felt that an increase in the controlled price was required and that

canning plants should be opened; two canning firms had in fact been formed at this time but were having difficulty in finding suitable premises or land.³⁹

That the regulation of the supply to the consumer was going to be one of the major distributive difficulties with pilchard catches was obvious at this time, and at a meeting of the Cornwall Sea Fisheries Committee towards the end of 1946 it was agreed to ask the Ministry of Agriculture and Fisheries and the Ministry of Food to investigate the possibility of establishing refrigeration plant* to regulate the supply of pilchards to the various markets (including to the longliners).⁴⁰ Because of the uncertain nature of the landings and of markets for the fish, no large plant was set up although smaller cold stores were installed by canning companies.

As the supply of fish to Europe was sufficient without pilchards, U.N.R.R.A. was unwilling to pay a higher price but the fishermen felt that the existing price paid was too low and suggested three ways of improving the situation:

- (a) The levy paid for transporting fish to market should be reduced.
- (b) By arrangement, the curers' profit should be cut; the fishermen pointed out that they had at times been paid 2s.3d a stone and the curers continued to operate at a profit.
- (c) The Minister should press for a better deal with U.N.R.R.A.²⁶

* Presumably this equipment was to be of a cold store and not deep freezing type.

Shortly after this the Minister of Food instigated an investigation into the costs of curing pilchards for export for U.N.R.R.A.²⁷ In August 1946 pilchards (and sprats) were released from maximum price control, but the Minister stated that he would continue to encourage exports of cured pilchards, and if contracts were made with U.N.R.R.A. or similar bodies he would see that the fishermen got a fair price for fish sold for curing.³⁰

Attempts to find markets for pilchards were continued and in July the Minister promised to bring to the attention of the President of the Board of Trade, the possibility of reviving exports of herrings and pilchards to Russia so that this could be considered in future trade negotiations between the two countries.⁴¹ Discussions also took place between the Ministry of Food and the Italian Government,³¹ as a result of which the Italian Government agreed to import pilchards valued at £80,000 in the current season. The first consignment to leave Newlyn was arranged by Henry Sutton Ltd. of Great Yarmouth.⁴²

Experiments were carried out in the latter part of 1946 in refining pilchard oil to make margarine. The early small-scale trials were successful and the government offered 1s.1d per stone to the fishermen for sixteen tons of fish for a larger scale trial. The fishermen felt that they were in no position to subsidise government experiments and some thought that the government would be more gainfully employed investigating the following outlets for pilchards:

- (a) Fresh pilchards for the home market.
- (b) Canning for export and the home market.
- (c) Tanking and processing for export.⁴³

Shortly afterwards the Director of Fish Supplies offered to pay 2s.0d per stone for the pilchards for the experiment,⁴⁴ and the fishermen of Looe agreed either to supply the whole amount or to share the supply with the fishermen of Mevagissey. The experiment, which was unsuccessful, largely because of faulty machinery, was carried out early in 1947.

The marketing of shellfish did not present difficulties of similar magnitude to those experienced in marketing pelagic fish, and much of the distribution structure was similar to that in operation at present. There were, however, no crab processing plants of the size and type of those later installed at Paignton, Porthleven, Newlyn and Newton Abbot, although some of the shellfish were probably ultimately consigned to processing firms, such as Shippams of Chichester, for paste manufacture.

There were no large tanks for keeping lobsters and crawfish, such as those which exist at Porthleven, Weymouth and other places, but greater use was made of moored containers and at some places, such as Port Isaac and Porthwarra, natural tidal pools in the rocks⁴⁵ served as storage areas. These same storage methods are being used over twenty years later but the onus for keeping the fish alive has gradually been removed from the inadequately equipped fishermen to the coastal wholesalers, as the proportion of direct trade between the catchers and the inland merchants has declined while the coastal wholesalers, who in many cases collect the fish from the landing place, have become more important.

The marketing and distribution methods for types of shellfish other than lobsters, crabs and crawfish were generally similar to the present ones. Oysters from Whitstable were marketed in relatively small quantities

owing to the virtual cessation of the tending of the beds and the complete stoppage of the import of brood oysters in the war period, but were largely disposed of on the London market as at present. Another example illustrating the similarity to current practice is the despatch, for use as bait, of mussels unfit for human consumption from the River Taw in North Devon to the North-East coast.⁴⁶

3. The Changes in Processing, Marketing and Distribution between 1946 and the early 1960's

Many of the changes that have taken place have been alterations in scale. This is particularly so with relation to the fall in the number of fish salesmen and buyers at the various ports. In 1954 there were still auctions at Looe, Polperro and St. Ives⁴⁵ but these no longer function. This general decline has accompanied the reduction in landings and has, in turn, sometimes put the fishermen in a worse financial position owing to the lessening competition for their fish.

The methods by which these difficulties have been overcome in recent years at Newlyn, Brixham, Rye and Mevagissey have already been outlined, but the problems are by no means new* and for many years catches from smaller ports have been taken to centres where better selling facilities exist.

In 1953 complaints were made by fishermen of the existence of a "buyers' ring" at Looe.⁴⁷ This was refuted

* A Committee of the Economic Advisory Council expressed the view, in a report on the fishing industry, in 1932, that co-operation or mutual trading in both buying and selling afforded the greatest hope for the future of the inshore industry.

by a local buyer but the fishermen decided to sell their fish on Plymouth market. The new arrangement was short-lived but presumably there was some basis for the initial dissatisfaction.

At Porthleven there was a buyer until 1950. He went out of business and the fish were then marketed at Newlyn until 1954 when a London firm opened an office at the port.⁴⁵ This closed late in 1955 and again the fish were landed at or taken to Newlyn⁴⁸ until Porthleven Fisheries, Ltd. started operating in the 1960's.

It should be remembered that discontent with the marketing system at Brixham is by no means new (Chap. 2), for it led to the formation of Brixham Fishermen Ltd. in 1957. The single significant buyer operating in that year was the survivor of a group which had numbered four in 1954⁴⁵ and six just after the war.

Although the methods of distribution of fish caught within the region have shown few major changes since the war, markets which also serve as distribution points for fish from the major ports of the country have experienced a decline in trade in this sector, largely because of the increase in the amount of fish brought into the region by refrigerated transport and delivered directly to the fishmongers, so by-passing the local market. Evidence of this tendency has been particularly marked at Brighton and it has been suggested⁴⁹ that, while in 1959 the throughput of the local market was composed of approximately 75% fish from outside the region and 25% local produce, by 1964 the bias had completely changed and the respective figures were 25% and 75%. Over this period there were increases in landings made at Newhaven and Shoreham and marketed at Brighton.

but these can have accounted for only part of the alteration in emphasis.

Changes in pilchard processing methods may be examined quantitatively in Table 43 and the reduction in the export of cured pilchards to Italy is clearly shown. The associated decline in curing was at first, as far as the fishermen were concerned, counteracted by the increase in the quantity of pilchards canned; but after the peak of 1958 the number processed annually was progressively reduced.

TABLE 43

Production (000 cwt) of canned pilchards and exports to Italy of cured pilchards (1946-1961)

<u>Year</u>	<u>Total Landings</u>	<u>Canned</u>	<u>Cured</u>
1946	50	Not known	25
1947	61	Not known	8
1948	66	8	29
1949	60	18	28
1950	78	35	14
1951	81	38	16
1952	93	53	13
1953	104	46	13
1954	56	26	11
1955	91	50	2
1956	114	54	Figures not available from official sources after 1955.
1957	52	42	
1958	78	69	
1959	67	37	
1960	57	29	
1961	53	25	

Sources: White Fish Authority Annual Reports. A Compendium of Statistics relating to English Pilchard Fisheries 1947-1957. G.H. Buchanan-Wollaston. Unpublished. Sea Fisheries Statistical Tables.

Note: As virtually all cured pilchards are exported to Italy the figures given may be regarded as closely related to figures of production.

In January 1949, during the period when the quantity of pilchards cured was at its highest post-war annual level, curing vats were in use or usable at Mevagissey, Looe, Mousehole, Newlyn, Polperro and Porthleven.⁵⁰ Subsequently the numbers declined and, when the tanks at Mevagissey were demolished in 1966,⁵¹ there were none remaining in Cornwall apart from those in Newlyn.

The first pilchard cannery to be opened after the war was at Mevagissey⁵² early in 1947. During that same year two more commenced operations at Porthleven and Looe⁵³ and by 1949 there were others at Plymouth and at Newlyn.⁵⁴ The number of pilchard canneries in Cornwall and Plymouth was probably at its maximum when quoted as eight in 1953.⁵⁵ About a year later Frampton⁴⁵ named nine canneries which were taking pilchards. Of these three were outside the area at Great Yarmouth, Leytonstone and Chichester* and the remainder were at Plympton, Plymouth, Looe, Mevagissey, Newlyn and Hayle.

By 1958, pilchards were no longer being processed at Hayle and Leytonstone⁵⁶ and the number of factories dwindled until early in 1962, following the sale of the premises at Looe, fish were being taken regularly to only two canneries, at Mevagissey and Newlyn, and to Shippams' preparation plant which had been opened at Newlyn in 1955. Some were also being processed in Great Yarmouth. Apart from the installation of canning machinery at Newlyn by Shippams, the situation to-day is broadly the same although the total throughput is lower.

* At this time Shippams at Chichester were canning pilchards as well as making fishpaste.

Although many of the problems of the pilchard industry have been due to the uncertainty of markets owing partly to lack of publicity and uncertainty of catches, some of the marketing difficulty since 1952 has arisen from the fact that the home market has been largely saturated by pilchards imported principally from South Africa and South-West Africa (Table 44). These two countries, helped by the economic advantages of employing large-scale operations in their vast fisheries, have been able to market their product more cheaply in this country than is possible for the home-caught product.

TABLE 44

Imports (tons) of Canned Pilchards and the
Principal Countries of Origin

<u>Year</u>	<u>S. Africa</u>	<u>S.W. Africa</u>	<u>Total</u>
1950	-	-	-
1951	250	-	250
1952	4,890	750	5,640
1953	2,050	650	2,700
1954	1,185	2,840	4,050
1955	2,461	6,230	8,692
1956	991	11,194	12,185
1957	353	9,294	9,725
1958	480	11,718	12,217
1959	259	9,549	9,858
1960	376	11,841	12,231
1961	1,913	9,256	11,186
1962	1,442	10,233	11,692
1963	1,973	9,574	11,564
1964	1,703	10,935	12,638
1965	Division not known		11,154

Sources: Annual Reports of White Fish Authority and Sea Fisheries Statistical Tables.

Other methods of processing pilchards on a large scale have been suggested but never put into operation. The early post-war margarine experiment may be cited as one example (page 344). Consideration has also been given to the construction of a fish meal and oil plant in the south-west to take surplus fish and offal from the whole of the industry in the region; much of the production could have been based upon excess pilchards. In 1953 the White Fish Authority was negotiating for a site on which to build a factory at Plymouth.⁵⁷ In the spring of 1954 the Authority learned that two canning companies were considering erecting similar plants⁵⁸ and later decided not to go ahead with their own project but to give financial assistance to the private companies. Neither of these companies carried out the proposed extensions although a small plant operated at Carnkie near Redruth in Cornwall between 1957 and 1959. Fish from near-by ports were processed but supplies were not sufficiently consistent to allow economic operation. In the early 1960's there was also a factory at Bridport; offal from Brixham⁵⁹ and presumably from other centres was processed.

Several of the outlets for sprats have changed little during the post-war period. The relatively small landings from the south coast of Kent and Sussex have been principally taken by the fresh market, while the larger landings from Whitstable, the Torbay area and Poole have been taken by the canners, curers and the fresh market. Surpluses have gone to fish meal plants and more recently to petfood manufacturers. According to information provided by the District Inspector of

Fisheries for the Ministry of Agriculture, Fisheries and Food for the south-eastern area, sprats from Whitstable were purchased by the Melton Mowbray cat food manufacturing firm (p. 328) for the first time in January, 1962.

A cannery was opened at Whitstable early in 1956 to take the local sprats. At the same time an associated cold store was brought into use at Maidstone and on occasions fish were also put into a similar plant at Folkestone. Catches decreased and the cannery closed in May, 1961, when the owning company transferred all canning to their new factory at Fraserburgh.¹² The Whitstable plant was the only cannery which was opened primarily to process local-caught fish. Previously fish had been transported by road to canneries at Leeds and Dundee; these canneries, which were owned by the same company, also closed in 1961 as part of a rationalisation programme. For a time, a fish-meal plant at Minster Thanet, near Ramsgate, took surplus sprats, but this plant, too, closed in the early 1960's.

A large proportion of the sprat landings at Brixham and Torquay was sent for canning. This outlet has now been lost but sprats are taken for other forms of processing (p. 326). The firm that opened at Topsham in about 1957 had previously processed these fish at Brightlingsea, and indeed continued to do so until 1961, but opened the West Country factory in order to be near additional sources of supply, as fishing off the east coast was not good at the time. The company also has a long-established plant at Lowestoft, but herring are mainly processed there. In addition to the fish taken

from the Torbay area, supplies have been obtained from Poole and other near-by ports and from the east coast (although not from Whitstable). Most of the production is exported¹⁰ and from April 1958⁶⁰ sprats were exported in barrels from Topsham by coasters which brought Danish lager on the return journey.

Table 45 shows the production of canned sprats in Great Britain between 1949 and 1959. The production from fish caught in southern England is not isolated but the fluctuations nevertheless reflect changes occurring in that region.

TABLE 45

Intake and Production of Sprats by Canning Factories

<u>Year (Sept.-Oct.)</u>	<u>Intake of fresh sprats (tons)</u>	<u>Production of canned fish (tons)</u>
1949-1950	2,575	1,582
1950-1951	2,110	1,217
1951-1952	2,745	1,651
1952-1953	1,175	715
1953-1954	1,936	1,185
1954-1955	3,125	1,600
1955-1956	3,284	2,128
1956-1957	2,659	1,645
1957-1958	2,502	1,422
1958-1959	1,917	1,121

Source: Annual Reports of the White Fish Authority.

The low production in 1952-1953 occurred because the canners were still holding large stocks from the previous year. The White Fish Authority made arrangements with the Herring Industry Board, under which the Board took surplus sprats for reduction to oil and meal.⁵⁷ After a peak in

1954-1956, production decreased steadily; a state almost entirely due to the poor fishing in the Thames Estuary and in southern England during that period.^{61, 62, 63}

It has previously been mentioned (page 317) that the principal changes taking place in shellfish distribution methods have been a result of the entry since the middle 1950's into the industry of some larger concerns both on the catching and on the distribution side; these alterations have affected mainly the catches of crabs, lobsters and crawfish. Most other changes have been in degree only.

Although the reduction in the numbers of fish wholesalers has affected almost all sections of the fishing industry of southern England, many of the changes mentioned have been concerned with the distribution of individual types or groups of fish. There are other changes which have had an effect over the whole industry.

One of these is the system of controls placed on the distribution system and on the maximum prices at which fish could be sold at the various stages of distribution. Some relaxation had been evident by the end of 1946 and further decreases in restrictions^{64,65,66} were made in May, July and October 1947, when wholesalers were given greater freedom to choose their customers (and vice versa) and when it was stated that wholesalers' licences would be granted to suitable applicants on a probationary basis. The Shellfish (Maximum Prices) Orders of 1943 and 1944 were revoked during the same year and further concessions were made to the fishermen in the Fish Control and Maximum Prices Order, 1947, which took effect from 20th September;

prices at first hand sale and retail were increased and mackerel were excluded from the Order.⁶⁷ This latter exclusion came after a mention in the House of Commons by the Member for South-East Cornwall that East Coast drifters were not going to Newlyn for mackerel fishing as the controlled price of the fish could not justify the journey.⁶⁸ Further relaxations of restrictions occurred during subsequent years and with the introduction of the Fish (Revocation of Controls) Order, 1950⁶⁹ maximum price control ceased to operate on 15th April, 1950.

A second factor which has affected the entire fishing of the region has been the payment of operating subsidies,* which were first given on 4th December 1948.⁷⁰ They were withdrawn with the ending of maximum price control in April 1950 but re-introduced on 31st July 1950 following the slump in fish prices. They have been provided for all vessels fishing in the area. Initially a stonage rate was paid on all British-caught fish from inshore, near and middle waters, but from 31st July 1950 the system for "near and middle water" vessels (i.e. defined as those greater than 70 ft. but less than 140 ft. in length until 1st August, 1962, and as those greater than 80 ft. but less than 140 ft. in length afterwards) has shown marked differences to that for "inshore" vessels (i.e. defined as those less than 70 ft. and 80 ft. in length respectively). The rate of subsidy payable to both types of craft has frequently been varied.

* Most of the information on operating subsidies has been synthesised from Annual Reports of the White Fish Authority.

The payment to "near and middle water" vessels was, until 1953, on a sliding scale and was dependent upon the gross earnings and duration of each voyage. From 1st April 1953 until 31st July 1956 a payment was also made on the quantity of fish landed and sold for human consumption but from 1st August 1956 the subsidy was paid solely on the basis of voyage duration of each boat. This still holds, although under the provisions of the Sea Fish Industry Act, 1962, the government is committed to the gradual elimination of this subsidy by 1972. Under this Act "special subsidies" were to be granted to sections of the fleet over 80 ft. in length with special difficulties. Payment under this heading was made to qualifying vessels at Newlyn until 31st July 1964 and at Brixham until 31st July 1965.

Until 1962 all "inshore" vessels were subsidised at a stonage rate. Payment by this method was continued for all boats of below 60 feet in length until 1st August, 1966 and is still made on every fishing boat of less than 35 feet in length. The rate is dependent upon the type of fish landed, whether it is gutted or ungutted and whether or not it is intended for human consumption; the ultimate use to which the fish is put was not considered in the assessment prior to 1st August, 1963.

Since 1st August, 1966 boats of between 35 feet and 60 feet in length have been assisted by payment on either a stonage or a voyage basis depending upon the provisions already outlined for sprat fishing (page ³²⁹). The appropriate stonage rate is identical to that given for the landings of smaller vessels and the voyage rate, like

that provided for bigger craft, varies according to the length of the boat.

At present, other "inshore" vessels (i.e. those of between 60 feet and 80 feet in length) have a subsidy at a voyage rate. This has applied to boats in the 60 feet to 70 feet category only since 1962 but for vessels of between 70 feet and 80 feet in length it has operated for much longer as these were previously in the "near and middle water" group.

In present circumstances it is likely that large parts of the inshore industry could not survive without the subsidy, and there is no immediate intention of stopping it for this section, although it was stated in 1961 in the White Paper on the Fishing Industry⁷¹ that the government intended to review the situation before the end of a ten-year period.

No subsidy has been paid on shellfish landings although requests have been made on several occasions for these fish to be included in the subsidy system. It was stated in the Fleck Report of 1961⁷² that shellfish are largely a luxury food, are not sold in direct competition with white fish and herring and cannot in any way be regarded as a staple food. The Committee was not satisfied that a case for payment of a subsidy had been made out, so it seems unlikely that a subsidy on landings will be paid in the future. Many fishermen, too, are uncertain of the advantages, as the introduction of such a system might mean that their entire catches would have to be declared; this could mean that they would be compelled to reveal, for tax purposes, many of the profitable but unofficial methods of disposing of their fish.

A further important change has been the increase in the use of road transport at the expense of rail for long distance journeys. This trend has been evident, particularly with consignments from Newlyn, for many years (Table 46), and Suttons (Cornwall) Ltd. introduced refrigerated lorries on the route from that port to London in 1960. Stevensons have also used road transport since they started sending their own fish to London. According to an estimate made by the Ministry of Agriculture, Fisheries and Food Fishery Officer at Newlyn, some 80% of the fish leaving that port was going out by road; it can be seen from the Table that in 1951 at least 77% was leaving by rail. Consignments of pilchards have been sent by road from Cornwall to Great Yarmouth, Chichester, Leytonstone and other places for processing. The first experimental road trip for pilchards to Great Yarmouth was in 1949. They arrived in good condition and further consignments were made.

Even some of the less important merchants have their own lorries, although some individuals in this group continue to use the railways to take their fish, particularly if, like one Newlyn buyer, they send small consignments to a variety of places. They may feel that it would be uneconomic to provide their own transport for such distribution and cannot accept the delays which might be involved if British Road Services were employed.

Brixham provides a rather special example and the retention by British Rail of a reasonable proportion of the fish transport business, even since the local station closed in 1963, and Churston, about two miles away, became

the consigning station, has been largely due to the attractive rates negotiated between the fish traders at the port and British Rail.⁷³

The overall decline in the use of railway transport has been caused by several factors among which the following may be cited as being predominant:

1. Lack of flexibility of railways which has often meant considerable handling for a perishable product.
2. The Rail Strike of 1955 caused some users to make alternative arrangements. Many never used the rail services again to transport fish.
3. If road transport is used, particularly if it belongs to the fish merchant, he can exercise greater control over the fish, than if it is taken by rail and trans-shipped at both ends of the journey and also, perhaps, at intervening points.
4. The closure and proposed closure of many small railway stations, which in the south-west have sometimes been consigning stations for fish.
5. A tendency to follow what the other man is doing.
6. A growing belief, due to adverse publicity, that railway transport is "bad" while road transport is "good".

The type of transport used for shorter journeys, to take fish from small ports to towns with markets or to transport fish to railway centres or to processing plants, has over the whole period since the second World War been made almost entirely by road. Sometimes, because railways

TABLE 46

Quantity (tons) of Fish consigned by Rail
from South-western Stations

<u>Forwarding Station</u>	<u>1945</u>	<u>1948</u>	<u>1951</u>	<u>1954</u>	<u>1957</u>	<u>1960</u>	<u>1963</u>
Brixham	1,900(85)	3,687(127?)	2,444(86)	1,750(82)	1,000(49)	1,000(49)	1,100(76)
Falmouth					114	130	116
Grampond Road							
Looe				76	124	71	40
Penryn				137	132	19	5
Penzance						119	81
St. Austell			3,827(77)	1,817(40)	1,182(27)	928(23)	731(21)
				782	798	794	562

Source: British Rail.

Notes: 1. The principal destinations of fish traffic from these stations are as follows:

Barnstaple	Birmingham	Exeter	Plymouth	Seaton	Totnes
Bath	Bristol	Falmouth	Portsmouth	Southampton	London (Billingsgate)
Bideford	Cardiff	Guernsey	Redruth	Taunton	

2. The figures shown in brackets for Brixham and Penzance are the percentages of the landings of wet fish at Brixham and Newlyn respectively that the quantities consigned represent.

3. Fish were probably sent from all these stations throughout the period, and the blank spaces are most likely indications of lack of available information.

4. These statistics probably provide a reasonable guide but their accuracy in detail may be open to question. Figures given in 1955 by British Railways⁷⁴ showed fish transport from south-western centres in 1954 was as follows:

Brixham	1,171 tons	Penzance	1,818 tons	Falmouth	38 tons	Plymouth	114 tons
Kingsbridge	257 tons	St. Austell	782 tons	Looe	77 tons	St. Ives	109 tons

5. As Brixham station closed in 1963, presumably consignments shown as leaving that station during 1963 include fish taken from Churston.

have not been in existence over the routes, but even in the south-east, where there is a more extensive railway network, the railways have not been geared for fish traffic and the quantities carried have been, in any case, small. In these circumstances it has been found to be more convenient to take the fish by road.

The changes likely to take place in the future in marketing and distribution are difficult to forecast, although it seems likely that the tendency to fewer and larger wholesaling concerns will continue. Co-operation in this sphere will almost certainly increase, for schemes both small, as at Rye, and relatively large, as at Brixham, afford the greatest hope for the inshore fishermen to obtain a higher proportion of the final selling price of their fish and, in the ultimate reckoning, a greater chance of survival.

1. Annual Report of the Fisheries Organisation Society Ltd. for the year ending 31st December, 1961.
2. Annual Report of the Fisheries Organisation Society Ltd. for the year ending 31st December, 1962.
3. Personal communication from the Chief Fishery Officer of the Sussex Sea Fisheries District. 27th August, 1967.
4. Fishing News No. 2616. 26th July, 1963.
5. White Fish Authority Annual Report for the Year Ending 31st March, 1962.
6. Fishing News No. 2728. 17th September, 1965.
7. Fishing News No. 2604. 3rd May, 1963.
8. The Cornish Pilchard and its Fishery. Laboratory Leaflet (New Series) No. 9. Ministry of Agriculture Fisheries and Food, 1965.
9. Fishing News No. 2622. 6th September, 1963.
10. Personal communication from the District Inspector of Fisheries, Ministry of Agriculture, Fisheries and Food, Plymouth. 10th February, 1964.
11. Personal communication from the Chief Fisheries Officer, Southern Sea Fisheries District. 2nd February, 1964.
12. Personal communication from the Managing Director, British Fish Cannery, Ltd. 6th April, 1964.
13. White Fish Authority Annual Report for the year ending 31st March, 1964.
14. White Fish Authority Annual Report for the year ending 31st March, 1966.
15. The White Fish and Herring Subsidies (United Kingdom) Scheme 1966. Statutory Instrument 1966 No. 961.
16. The White Fish and Herring Subsidies (United Kingdom) Scheme 1967. Statutory Instrument 1967. No. 1132.

17. Personal Communication. J.A. Bridger, Director of Brice Bros., Ltd., Billingsgate, Shellfish Merchants, 31st March, 1964.
18. Personal communication from C.L. Hollands, General Manager, Porthleven Fisheries, Ltd. 4th October, 1967.
19. Fishing News No. 2630. 1st November, 1963.
20. Fishing News No. 2517. 1st August, 1961.
21. Letter from Fishery Officer of Newlyn to T.D. Kennea. 12th November, 1963.
22. Fishing News No. 1683. 23rd June, 1945.
23. Fishing News No. 1694. 8th September, 1945.
24. Fishing News No. 1716. 9th February, 1946.
25. Fishing News No. 1721. 16th March, 1946.
26. Fishing News No. 1725. 13th April, 1946.
27. Fishing News No. 1729. 11th May, 1946.
28. Fishing News No. 1733. 15th June, 1946.
29. Fishing News No. 1735. 29th June, 1946.
30. Fishing News No. 1740. 3rd August, 1946.
31. Fishing News No. 1748. 28th September, 1946.
32. Fishing News No. 1750. 12th October, 1946.
33. Fishing News No. 1767. 8th February, 1947.
34. Fishing News No. 1763. 11th January, 1947.
35. Fishing News No. 1794. 30th August, 1947.
36. Personal communication from G.H. Buchanan-Wollaston, 12th November, 1963.
37. Fishing News No. 1706. 1st December, 1945.

38. Fishing News No. 1700. 20th October, 1945.
39. Fishing News No. 1719. 2nd March, 1946.
40. Fishing News No. 1759. 14th December, 1946.
41. Fishing News No. 1738. 20th July, 1946.
42. Fishing News No. 1761. 28th December, 1946.
43. Fishing News No. 1753. 2nd November, 1946.
44. Fishing News No. 1754. 9th November, 1946.
45. The Fisheries of Devon and Cornwall. R.H.C.F. Frampton. Ministry of Agriculture, Fisheries and Food. Unpublished, 1954.
46. Fishing News No. 1699. 17th March, 1945.
47. Fishing News No. 2121. 12th December, 1953.
48. Personal communication from R.H.C.F. Frampton. 16th January, 1956.
49. By the Chief Fishery Officer, Sussex Sea Fisheries Committee.
50. Memorandum - Cornwall Sea Fisheries Committee - 1949.
51. Fishing News No. 2763. 20th May, 1966.
52. Fishing News No. 1806. 22nd November, 1947.
53. Fishing News No. 1812. 3rd January, 1948.
54. Fishing News No. 1918. 14th January, 1950.
55. Fishing News No. 2087. 18th April, 1953.
56. Fishing News No. 2382. 12th December, 1958.
57. White Fish Authority Annual Report for the year ending 31st March, 1953.
58. White Fish Authority Annual Report for the year ending 31st March, 1954.

59. Quarterly Report of the Fisheries Officer for the Devon Sea Fisheries Committee for the period ending 25th May, 1961.
 60. Fishing News No. 2395. 13th March, 1959.
 61. White Fish Authority Annual Report for the year ending 31st March, 1958.
 62. White Fish Authority Annual Report for the year ending 31st March, 1959.
 63. White Fish Authority Annual Report for the year ending 31st March, 1960.
 64. Fishing News No. 1778. 10th May, 1947.
 65. Fishing News No. 1780. 24th May, 1947.
 66. Fishing News No. 1800. 11th October, 1947.
 67. Fishing News No. 1797. 20th September, 1947.
 68. Fishing News No. 1786. 5th July, 1947.
 69. Fishing News No. 1931. 15th April, 1950.
 70. Fishing News No. 1861. 11th December, 1948.
 71. White Paper. The Fishing Industry. Cmnd. 1453. August 1961.
 72. Report of the Committee of Inquiry into the Fishing Industry under Sir Alexander Fleck - H.M.S.O. Cmnd. 1266 - 1961.
 73. Personal communication from Market Research Officer, British Rail, Western Region. 18th April, 1964.
 74. Personal communication from the Public Relations and Publicity Officer, British Railways, Western Region. 7th October, 1955.
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CHAPTER 10

CONCLUSIONS AND THE FUTURE

In this area, most vessels fish no more than 150 miles from their home ports and the opportunities for any major development of the catching side of the industry are obviously limited. If there is to be any significant improvement, without introducing a fishing fleet capable of exploiting more distant grounds, fish stocks within and which supply the small region of exploitation must be permitted to expand and then maintained at a relatively high level. The Fishery Limits Act of 1964 was designed to help to this end by making provisions to exclude foreign fishing vessels from a zone between the shore and twelve miles distant from a chosen base-line. Concessions were made to designated nations whose vessels had traditionally fished for certain species in some British waters; they were permitted to fish for these species in the outer six miles of the zone in the area in which they had traditionally operated. Previously, the limit for all foreign vessels had been three miles out to sea from a base-line which cut less severely (for the foreign vessels) across many inlets than does its successor. To assist with the administration of the Act, British Sea-Fishery Officers were given power to board any foreign fishing vessel within the fishery limits of the British Isles adjacent to the United Kingdom, examine its nets and, if necessary, take the vessel to the nearest or most convenient port pending legal action. The overall

result has been to reduce fishing effort over quite a wide area which includes many nursery grounds. The result cannot be anything but beneficial to fish stocks although it is, as yet, too early to assess its effect on the inshore fishing industry.

Nevertheless, it must be appreciated that this is one very small part of a problem of global magnitude which cannot be solved without international agreement and co-operation. The implications of reducing fishing effort on nursery grounds, not only off the south coasts, but also along other British coasts are, nevertheless, wider than might at first be suspected; fish which might later move offshore to form part of the object of the more significant fisheries in the North Sea and off our west coasts are protected at a crucial stage in their development. This is obviously important but its value could be significantly reduced if there was a considerable expansion of the British inshore fleet. Even so, the problem would not be as great, for the average size of fish taken by British vessels is likely to be larger than that caught by foreign vessels fishing the same grounds and more immature fish would be left, as British vessels are much less liable than foreign vessels to be fishing with nets having undersized meshes. Because of the limited extent (and therefore limited fish supporting capacity) of the areas fished by southern English vessels and because there is little possibility of an important new fishery forming near at hand, it is unlikely that a fishing fleet, which would be regarded as even moderately large by national standards, will develop in the south of England for additional exploitation of the grounds at present worked.

If there is to be any significant expansion in the future, almost certainly it will be based on the exploitation of stocks outside the operating range of the vessels comprising the present fleet. Such an occurrence is difficult to visualise, however, for even if a fishery were to be developed in the south Atlantic, following the recent investigation by members of staff of the White Fish Authority and Ministry of Agriculture, Fisheries and Food,¹ it is unlikely to be of much advantage to the south-west for some years, despite the relative closeness, compared with that of other centres in the country, of most ports in the region to these fishing grounds. Nowhere in the south-west are there facilities for dealing with the catches of freezer-trawlers, and vessels fishing these southern areas would have to be of this type. The cost of installing the necessary buildings and equipment would be considerable so, if such a fishery commenced, presumably it would be based at the east coast ports, where vessels of this type are handled at present, until such times as the operating companies were convinced that the savings resulting from the shorter sea journey offset any increased cost caused by operating in the south-west rather than, for example, on the Humber.

Plymouth is the only port in the south-west where both significant quantities of fish are landed at present and the necessary ocean-going craft could be accommodated. Such vessels could also be handled at Falmouth which is, however, only a minor fishing port, even by southern standards.

Neither Newlyn nor Brixham is suitable for such a role without considerable expenditure on harbour enlargement and deepening. This outlay would be additional to that required

on shore facilities, which would be little different whether the town already had a fishing industry or not, for the difference between the existing organisation, whether it be primitive as at Falmouth, or fairly well developed as at Newlyn, and that needed for a major fishing port would be considerable. Probably even greater, though, would be the cost of alterations necessary to provide sufficient deep water berths at Newlyn or Brixham while the cost of making similar provisions at centres already with large harbours would be relatively small. Consequently, if it were to be decided to build a large fishing port in the south-west, the choice would almost inevitably rest between Plymouth and Falmouth, although Portsmouth, which is better situated than either of the others in relation to markets, could not be ruled out.

It should be remembered, however, that the declining but still moderately important fishing port of Milford Haven has, in many respects, stronger claims for consideration than any of the centres already mentioned for, although it has little greater capacity than they have for handling large quantities of frozen fish, and is in broadly the same position relative to the fishing grounds, it has facilities, now insufficiently used, to accommodate and dispose of the catches of fairly large fishing vessels.

It is pure speculation to anticipate the development of such a distant water fishery, but one may with rather more confidence attempt to forecast changes which do not envisage the commencement of an entirely new fishery, though even here there are so many influential variables that one must

couch the prognosis in general terms and restrict it to cover a relatively short period, certainly not more than ten years. For justification of this limitation several examples of abrupt changes, not all in the post-war period, can be cited; the decline of the Plymouth herring fishery during the 1930's, the reduction in landings of oysters following hard winters, the increase in the landings of shellfish off the north Cornish coasts in the 1960's, and the general improvement in the catches of cod over approximately the same period.

It is almost certain that the reduction in foreign fishing activity within the twelve-mile limit will be to the advantage of the British fishing industry and it would be reasonable to expect some general increases in the landings of demersal fish made by the inshore fleet. There will also probably be some benefit to the sections of the shellfishing industry concerned with catching crabs, crawfish and lobsters, but it is unlikely that the pelagic fishery will be much affected because of the predominance of other factors.

Landings of crawfish which have for several years been at a high level, partly because of the activities of skin divers, might decline sharply if the Cornwall Sea Fisheries Committee were to limit this method of fishing. Feelings between the skin divers and fishermen using traditional methods often run high, with the latter complaining of over-exploitation of the grounds by the former and sometimes accusing them of taking fish from their pots. There is little evidence at the moment to suggest that over-fishing is occurring, but it is likely

that skin diving for crawfish will be restricted if only to prevent it getting out of hand, for there can be no doubt that it is a very efficient form of fishing.

One cannot reasonably foresee any considerable growth in the oyster fisheries of the region. Climatically, the areas best suited are in the south-west, but here the grounds are limited in extent and, in any event, a considerable capital outlay followed by a marked improvement in cultivation procedures is required before an important fishery which is independent of imported brood can be established. The Thames estuary has a less favourable climate but in other respects is more suitable. In the past there have been good fisheries but these have dwindled almost to insignificance; some expansion is probable following the take-over of the Seasalter & Ham Oyster Fishery Co. Ltd. by Associated Fisheries, Ltd., but no major development is likely to take place until the company has had some experience of small-scale operation and is certain that there is a market for the additional output.

For the pelagic fisheries also, the future is uncertain. Despite the claims that large numbers of pilchards exist in the English Channel, it is difficult to imagine that the decline in the landings of this species will be halted. Operations at present are not sufficiently profitable to prevent the fleet of small vessels dwindling and, before there can be any development involving larger craft which, it has been suggested, are necessary to exploit the stocks, it must be convincingly proved that they can consistently land good quantities of fish for which an economic outlet is available.

Much larger landings of sprats could often be made from the Poole, Weymouth and Torbay areas, but these would probably still be dwarfed by the catches made off eastern Scotland. Expansion is unlikely because of the difficulty of competing economically with the produce of the more prolific areas, particularly as the nearest fish-meal plants are on the east coast and the only major cannery is at Fraserburgh. It is doubtful whether the quantities taken would in any event be large enough or sufficiently reliable to justify the opening of a processing plant locally in addition to the smoking and curing factory already in existence at Topsham. The fishery in the Thames estuary from Whitstable has been notable for its variability and, as there is no reason to suspect that it will stabilise, no major developments can be expected.

The inshore summer and autumn mackerel fishery of the south-west has largely filled the void left by the decline of the pilchard industry and, as there is a reasonable demand for mackerel as a cheap, palatable food, it is to be expected that the present economical methods of exploitation will continue. Nevertheless, one cannot help but feel that more intensive methods of exploitation such as ring netting, although requiring greater capital outlay, might pay dividends and would certainly be worthy of experiment.

Future developments in the British deep-sea mackerel fishery should not be ruled out despite its present low state. The catches made in recent years during the early winter by French vessels have not been emulated by British drifters, which do not operate in the area until later in the winter following the completion of the herring fishery

in the south-east. As these latter activities are now of small importance, it could be worthwhile for some vessels to forsake them and operate in Cornish waters somewhat earlier in the season.

During the next few years, it is to be hoped that marketing methods will be altered to the benefit of the fishermen; with so many inshore operators functioning on an extremely slim profit margin, it is vital that as high a proportion of the total final selling price as possible reaches the catcher. At many centres where there are few buyers the fishermen are in a weak position unless they change their selling procedure. Greater co-operation is essential if only to present a united front to the buyer, but it is far better if they take the degree of co-operation further, form a marketing co-operative and arrange to sell their fish directly at inland markets or under contract to a processor or other large consumer. This is relatively easy where moderate quantities of fish are landed, such as at Brixham, but at smaller centres where supplies are less reliable the fishermen have less to offer. In such instances, it may be possible for operators from several centres to unite in a joint venture, which may be less convenient than if only one place is involved, but should show considerable advantages over the existing system.

Such an arrangement would inevitably lead to a further reduction in the already limited number of port markets. Admittedly, these markets serve a purpose in bringing the buyer and seller together but, as fairly small quantities of fish are usually involved, it is doubtful if they are

so useful that their function could not be performed at least as well, and more profitably for the fishermen, by a marketing co-operative. In addition, by avoiding the delays and extra handling which inevitably occur in the markets, fish probably reach the consumer in better condition.

As a further general aid towards an improvement in the quality of the fish when it is finally sold, it is to be hoped that the examples already set for boxing fish on board and, where necessary, taking ice to sea will be more generally followed.

On the catching side of the industry, there are marked differences in the pattern of fleet ownership between the inshore and other sections. Many vessels in the former category are skippered by their owners, although there are some families who operate two boats. In the other group, the craft are usually larger and function most commonly as units of company-owned fleets. Except with W. Stevenson and Sons, Ltd. this latter method of operation has not met with much success since the war in the southern area. Several trawling firms at Brixham ceased operations and the Plymouth company of Turner Bros. Ltd., whose activities are now restricted principally to marketing, owned several vessels after the war but has had only one for several years. The shellfishing concern of Browse Bros. Ltd. contracted its fishing activities, and Porthleven Fisheries Ltd. has faced many problems in the operation of its craft. Looming large among the difficulties have been those of obtaining crews and exercising sufficient control over the operation of individual vessels, while the generally declining level of landings of many species during the 1950's did anything but help. In some instances it is doubtful if there was

sufficient financial backing available and often the vessels used were old and uneconomic in operation.

It does not seem that any major expansion in fleets of more than two boats can be expected but there is no reason to suspect that the growth in the numbers of individually owned medium size vessels will be halted. Small craft will continue to play a significant part in the inshore fishing industry of the area.

In the final analysis, any longer term hopes for a prosperous fishing industry in southern England, and indeed in all other areas, must be dependent upon adequate conservation measures; the problems of instituting these have already been mentioned but more action is necessary.

The problem of protecting demersal fish is the most acute and, although the employment of minimum mesh sizes undoubtedly protects immature fish of some species, because different species mature at different sizes, some immature fish do not escape. The institution of minimum sizes below which fish cannot be landed or sold is of little help, for if small fish caught in a net are returned to the sea after being brought on board they are often either dead or dying.

Greater use of line fishing at the expense of trawling might be an answer, for lines are more selective in their action than trawls: it is unusual for a small fish to be caught on a large hook. It is, unfortunately, a method which is uneconomic in its use of labour and is not well suited to catching all types of fish; it would probably be extremely tedious to catch and unhook sufficient quantities of plaice, for example, to operate a medium size vessel economically. Further, there are often difficulties in obtaining bait.

Rather more fundamental controls must almost certainly be used although, in order to determine their most suitable form, further research is obviously necessary. Nevertheless, there are several possibilities and these include the closing of known nursery grounds at certain times of the year and a restriction of fishing, to apply to both wet and shell fishing, perhaps by having a close season or perhaps by placing a limit on the quantity of fish to be taken annually from defined areas.

Despite the administrative difficulties, such controls would undoubtedly have the advantage of preserving fish stocks. Nevertheless, one cannot help but wonder whether, despite the necessity for them, they are not just further steps in the sophistication of what is essentially a primitive system. Is not the long term answer really the cultivation of the products of the sea?

1. Report of the White Fish Authority for the year ending 31st March, 1966.

APPENDIX 1

Quantity of each type of Fish landed from the
English Channel, 1946-65 by British Vessels

	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Bream	645	210	178	276	2	25	-	-	40	77
Brill	1,119	1,459	1,141	705	947	1,221	1,162	1,047	1,027	997
Cod	2,499	1,121	701	1,085	189	235	423	974	1,624	1,418
Conger Eels	7,751	7,594	4,986	5,711	4,688	7,856	7,902	7,939	10,548	7,699
Dab	1,156	1,877	1,565	708	708	1,436	1,057	1,401	1,041	1,774
Dogfish	30,420	26,550	28,512	44,533	25,092	21,772	15,548	17,470	8,145	6,230
Dory	762	963	1,015	988	891	834	699	476	436	452
Flounder	118	211	397	663	546	458	389	292	446	586
Gurnard	1,915	6,178	6,575	6,961	5,384	5,892	5,375	6,527	6,673	7,816
Haddock	68	3	1	10	-	-	6	133	830	1,277
Hake	12,586	10,773	6,528	6,045	4,386	5,956	6,593	4,574	4,683	5,109
Lemon Sole	414	562	375	332	465	822	1,744	3,196	2,876	2,309
Ling	6,890	2,944	2,596	3,612	2,262	3,635	2,624	1,847	1,994	1,101
Megrim	662	1,973	1,913	2,078	1,547	2,112	2,140	1,256	1,515	2,054
Monkfish	1,827	2,723	2,532	2,518	1,695	1,662	1,599	1,671	1,720	1,491
Red Mullet	1,951	1,918	1,726	2,340	1,220	1,704	1,209	659	346	92
Plaice	22,775	16,303	21,598	15,398	9,485	9,594	10,981	14,640	12,409	11,988
Pollack	192	265	329	682	513	597	604	1,061	1,264	1,219
Skate	35,899	43,619	36,195	38,269	29,408	33,371	24,953	21,759	23,609	17,402
Sole	4,240	5,517	3,958	4,500	3,376	4,354	3,649	3,092	3,127	3,374
Turbot	3,275	5,195	4,610	5,902	3,405	3,410	2,592	2,293	2,272	1,090
Whiting	27,711	25,939	21,068	12,780	15,472	18,616	21,209	22,190	13,400	20,757
Others	3,934	3,915	6,908	6,477	4,350	5,891	4,729	9,027	6,387	6,396
Total	168,809	167,802	155,407	162,573	116,031	131,453	117,187	123,524	106,412	102,708
Herring	36,428	6,260	6,437	2,230	84,641	8,036	59,468	46,273	10,332	34,939
Mackerel	6,629	5,268	10,153	5,807	6,459	8,312	14,080	11,958	9,895	12,646
Pilchards	50,029	61,369	66,003	60,462	78,539	81,191	93,107	105,627	56,819	92,573
Sprats	8,936	12,310	18,508	21,730	28,224	32,922	44,023	33,648	15,041	14,606
Others	85	137	93	18	-	47	-	-	528	-
Total	102,107	85,344	101,194	90,247	197,863	130,508	210,678	197,506	92,615	154,764

(continued)

APPENDIX 1 (continued)

Quantity of each type of Fish landed from the
English Channel, 1946-65 by British Vessels

	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>
Bream	180	92	37	267	312	120	192	181	204	483
Brill	1,011	1,148	1,134	1,023	839	792	913	877	1,047	798
Cod	1,397	1,474	1,440	1,079	1,555	850	507	390	3,970	5,727
Conger Eels	8,247	9,503	7,813	7,896	6,835	3,963	1,740	1,452	2,137	1,127
Dab	1,558	924	1,319	772	643	325	342	1,027	2,080	1,815
Dogfish	4,512	5,618	3,383	2,438	2,775	1,612	1,068	903	827	413
Dory	393	307	268	267	277	273	212	96	126	184
Flounder	585	673	489	889	473	403	456	525	722	644
Gurnard	7,867	8,621	6,161	6,392	4,530	5,353	5,655	3,904	4,949	3,003
Haddock	456	718	391	373	416	74	71	956	2,546	1,211
Hake	3,365	3,440	3,892	3,771	3,787	3,521	2,888	1,057	956	923
Lemon Sole	1,730	1,664	1,412	1,419	1,117	1,859	1,734	1,101	1,265	1,549
Ling	846	1,699	1,321	1,319	1,615	1,541	887	469	593	523
Megrim	2,429	3,062	3,645	3,570	2,785	2,328	2,741	1,273	1,416	1,065
Monkfish	1,505	1,731	1,787	2,103	1,249	1,063	1,067	719	1,092	940
Red Mullet	179	692	239	126	384	619	200	34	12	9
Plaice	12,592	13,316	12,988	10,437	7,214	9,626	16,046	17,091	18,145	22,474
Pollack	1,003	822	1,019	1,648	1,597	1,124	940	923	1,260	2,049
Skate	19,804	27,346	22,713	21,371	18,581	15,348	14,970	11,932	11,271	8,515
Sole	3,265	3,734	3,399	4,341	3,967	4,233	4,645	5,382	3,625	3,065
Turbot	1,052	2,265	1,105	1,112	959	1,378	693	600	581	396
Whiting	13,941	14,864	22,471	16,725	19,697	11,829	13,345	11,954	20,993	18,761
Others	6,542	6,078	7,320	8,173	8,082	8,550	10,979	10,163	9,598	11,245
Total	94,504	109,791	105,746	97,511	89,689	76,784	82,321	73,009	89,415	86,919
Herring	39,343	16,477	8,397	5,698	1,755	6,434	1,400	1,160	2,385	1,843
Mackerel	10,069	13,340	10,779	11,205	11,725	10,353	10,798	14,776	13,106	9,629
Pilchards	116,062	55,658	78,906	69,318	51,796	46,642	36,721	36,417	30,671	23,784
Sprats	19,654	15,010	24,692	20,293	18,624	21,012	36,126	24,728	33,307	33,415
Others	6	4	-	113	-	82	6	17	185	510
Total	185,134	100,489	122,774	106,627	83,900	84,523	85,051	77,098	79,654	69,181

Source: Sea Fisheries Statistical Tables and, for 1965, figures supplied
by Statistics Department, Ministry of Agriculture, Fisheries and
Food.

APPENDIX 2

Main Demersal Fish (in cwts) and their Ports

(including Foreign Landings)

Skates, Whiting, Plaice, Conger Eels,Dogfish, Gurnard, Hake, Soles

<u>Skates</u>	<u>Newlyn</u>	<u>Brixham</u>	<u>Looe</u>	<u>Mevagissey</u>	<u>St. Ives</u>	<u>Plymouth</u>	<u>Porthleven</u>	<u>Folkestone</u>	<u>Ramsgate</u>
1947	21,340	11,960	4,635	4,367	4,307	3,107	2,692	2,502	2,135
1950	<u>Newlyn</u>	<u>Brixham</u>	<u>St. Ives</u>	<u>Folkestone</u>	<u>Plymouth</u>	<u>Looe</u>	<u>Mevagissey</u>	<u>Padstow</u>	<u>Ramsgate</u>
	19,755	12,681	3,542	2,561	2,512	2,481	1,773	1,272	1,160
1953	<u>Newlyn</u>	<u>Brixham</u>	<u>St. Ives</u>	<u>Folkestone</u>	<u>Mevagissey</u>	<u>Plymouth</u>	<u>Looe</u>	<u>Newhaven</u>	<u>Ramsgate</u>
	16,772	7,114	5,077	3,562	1,870	1,556	1,287	749	597
1956	<u>Newlyn</u>	<u>Brixham</u>	<u>St. Ives</u>	<u>Folkestone</u>	<u>Mevagissey</u>	<u>Whitstable</u>	<u>Plymouth</u>	<u>Ilfracombe</u>	<u>Hastings</u>
	17,233	6,131	3,777	1,968	1,463	1,253	1,030	799	420
1959	<u>Newlyn</u>	<u>Brixham</u>	<u>St. Ives</u>	<u>Mevagissey</u>	<u>Plymouth</u>	<u>Folkestone</u>	<u>Looe</u>	<u>Whitstable</u>	<u>Newhaven</u>
	19,529	4,826	3,441	1,408	1,328	1,116	1,114	980	575
1962	<u>Newlyn</u>	<u>Brixham</u>	<u>St. Ives</u>	<u>Folkestone</u>	<u>Plymouth</u>	<u>Ilfracombe</u>	<u>Whitstable</u>	<u>Newhaven</u>	<u>Mevagissey</u>
	15,902	3,228	3,016	1,282	1,229	875	621	499	392
1965	<u>Newlyn</u>	<u>St. Ives</u>	<u>Brixham</u>	<u>Folkestone</u>	<u>Newhaven</u>	<u>Plymouth</u>	<u>Whitstable</u>	<u>Ilfracombe</u>	<u>Mevagissey</u>
	10,966	2,212	1,305	696	477	449	374	314	278
<u>Whiting</u>	<u>Brixham</u>	<u>Plymouth</u>	<u>Mevagissey</u>	<u>Padstow</u>	<u>Looe</u>				
1947									
(foreign	10,763	6,876	5,679	1,698	1,085				
not included)									
1950	<u>Brixham</u>	<u>Plymouth</u>	<u>Newlyn</u>	<u>Padstow</u>	<u>Torquay</u>				
	10,081	2,787	2,041	1,139	894				
1953	<u>Brixham</u>	<u>Plymouth</u>	<u>Torquay</u>	<u>Newlyn</u>	<u>Mevagissey</u>				
	11,808	3,629	3,395	2,365	1,752				
1956	<u>Brixham</u>	<u>Newlyn</u>	<u>Plymouth</u>	<u>Mevagissey</u>	<u>Newhaven</u>				
	9,304	2,547	2,337	617	371				
1959	<u>Brixham</u>	<u>Plymouth</u>	<u>Mevagissey</u>	<u>Newlyn</u>	<u>Newhaven</u>				
	8,979	3,353	2,234	1,735	819				
1962	<u>Brixham</u>	<u>Newlyn</u>	<u>Plymouth</u>	<u>Mevagissey</u>	<u>Newhaven</u>				
	6,508	3,296	2,846	911	700				
1965	<u>Brixham</u>	<u>Plymouth</u>	<u>Newlyn</u>	<u>Mevagissey</u>	<u>Newhaven</u>				
	9,157	4,473	2,664	753	707				

(continued)

APPENDIX 2 (continued)

Main Demersal Fish (in cwts) and their Ports
(including Foreign Landings)

Skates, Whiting, Plaice, Conger Eels,
Dogfish, Gurnard, Hake, Soles

<u>Plaice</u>	<u>Hastings</u>	<u>Brixham</u>	<u>Rye</u>	<u>Folkestone</u>	<u>Ramsgate</u>	<u>Dungeness</u>	<u>Newhaven</u>	<u>Plymouth</u>
1947	3,762	2,994	2,690	2,493	2,192	1,986	1,113	1,093
1950	<u>Hastings</u> 2,563	<u>Dungeness</u> 2,295	<u>Ramsgate</u> 2,125	<u>Brixham</u> 1,882	<u>Folkestone</u> 1,631	<u>Hythe</u> 961	<u>Plymouth</u> 756	<u>Newlyn</u> 674
1953	<u>Hastings</u> 3,898	<u>Dungeness</u> 3,843	<u>Brixham</u> 3,073	<u>Folkestone</u> 1,932	<u>Newlyn</u> 1,126	<u>Hythe</u> 1,055	<u>Newhaven</u> 926	<u>Plymouth</u> 909
1956	<u>Hastings</u> 4,001	<u>Dungeness</u> 2,698	<u>Brixham</u> 2,444	<u>Folkestone</u> 1,925	<u>Newlyn</u> 1,438	<u>Plymouth</u> 965	<u>Hythe</u> 955	<u>Newhaven</u> 381
1959	<u>Hastings</u> 3,536	<u>Dungeness</u> 2,052	<u>Brixham</u> 1,463	<u>Newlyn</u> 1,147	<u>Folkestone</u> 978	<u>Rye</u> 890	<u>Plymouth</u> 812	<u>Hythe</u> 795
1962	<u>Hastings</u> 5,324	<u>Dungeness</u> 3,290	<u>Rye</u> 2,551	<u>Brixham</u> 1,838	<u>Newhaven</u> 1,382	<u>Folkestone</u> 1,367	<u>Hythe</u> 903	<u>Newlyn</u> 766
1965	<u>Hastings</u> 5,865	<u>Brixham</u> 4,273	<u>Dungeness</u> 3,833	<u>Rye</u> 2,334	<u>Newhaven</u> 2,109	<u>Plymouth</u> 2,030	<u>Folkestone</u> 1,682	<u>Newlyn</u> 1,355

Conger Eels

1947 (foreign not included)	<u>Newlyn</u> 8,529	<u>Mevagissey</u> 660	<u>Looe</u> 553	<u>Folkestone</u> 428
1950	<u>Newlyn</u> 5,328	<u>Mevagissey</u> 746	<u>Folkestone</u> 346	<u>Brixham</u> 323
1953	<u>Newlyn</u> 8,516	<u>Mevagissey</u> 1,332	<u>St. Ives</u> 820	<u>Polperro</u> 790
1956	<u>Newlyn</u> 6,985	<u>Mevagissey</u> 3,226	<u>Plymouth</u> 983	<u>St. Ives</u> 768
1959	<u>Newlyn</u> 4,196	<u>Mevagissey</u> 3,066	<u>Plymouth</u> 1,086	<u>Polperro</u> 976
1962	<u>Newlyn</u> 2,870	<u>Mevagissey</u> 554	<u>Folkestone</u> 549	<u>St. Ives</u> 276
1965	<u>Newlyn</u> 2,044	<u>Mevagissey</u> 530	<u>St. Ives</u> 339	<u>Looe</u> 142

(continued)

APPENDIX 2 (continued)

Main Demersal Fish (in cwts) and their Ports
(including Foreign Landings)Skates, Whiting, Plaice, Conger Eels,
Dogfish, Gurnard, Hake, SolesDogfish

1947 (foreign not included)	<u>Mevagissey</u> 10,503	<u>Newlyn</u> 9,046	<u>Plymouth</u> 4,579	<u>Folkestone</u> 2,470	<u>Brixham</u> 1,267	<u>Porthleven</u> 1,253	<u>Looe</u> 1,195
1950	<u>Mevagissey</u> 17,284	<u>Newlyn</u> 8,511	<u>Folkestone</u> 2,082	<u>Looe</u> 1,086	<u>Brixham</u> 917	<u>Newhaven</u> 387	
1953	<u>Newlyn</u> 13,330	<u>Mevagissey</u> 5,560	<u>Folkestone</u> 2,111	<u>Looe</u> 903	<u>St. Ives</u> 852	<u>Brixham</u> 298	
1956	<u>Newlyn</u> 5,549	<u>Brixham</u> 1,289	<u>Folkestone</u> 987	<u>Mevagissey</u> 599	<u>St. Ives</u> 484	<u>Ilfracombe</u> 399	
1959	<u>Newlyn</u> 3,964	<u>Folkestone</u> 1,242	<u>Ilfracombe</u> 556	<u>Brixham</u> 442	<u>Porthleven</u> 355	<u>St. Ives</u> 352	
1962	<u>Newlyn</u> 1,796	<u>Folkestone</u> 503	<u>Ilfracombe</u> 492	<u>Brixham</u> 433	<u>St. Ives</u> 242	<u>Beer</u> 88	
1965	<u>Newlyn</u> 1,674	<u>St. Ives</u> 467	<u>Folkestone</u> 346	<u>Ilfracombe</u> 159	<u>Brixham</u> 87	<u>Beer</u> 65	

Gurnard

1947 (foreign not included)	<u>Brixham</u> 2,834	<u>Plymouth</u> 1,863	<u>Newlyn</u> 516
1950	<u>Brixham</u> 2,589	<u>Plymouth</u> 1,614	<u>Newlyn</u> 814
1953	<u>Newlyn</u> 3,301	<u>Brixham</u> 3,102	<u>Plymouth</u> 667
1956	<u>Newlyn</u> 4,443	<u>Brixham</u> 4,166	
1959	<u>Newlyn</u> 4,011	<u>Brixham</u> 2,559	
1962	<u>Newlyn</u> 5,472	<u>Brixham</u> 1,468	
1965	<u>Newlyn</u> 3,600	<u>Brixham</u> 273	

(continued)

APPENDIX 2 (continued)

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Main Demersal Fish (in cwts) and their Ports
(including Foreign Landings)

Skates, Whiting, Plaice, Conger Eels,
Dogfish, Gurnard, Hake, Soles

<u>Hake</u>							
1947	<u>Newlyn</u> 10,433	<u>Brixham</u> 4,230	<u>Plymouth</u> 3,646				
1950	<u>Newlyn</u> 2,316	<u>Plymouth</u> 866	<u>Brixham</u> 814				
1953	<u>Newlyn</u> 3,008	<u>Brixham</u> 1,914	<u>Plymouth</u> 799				
1956	<u>Newlyn</u> 2,551	<u>Brixham</u> 1,414					
1959	<u>Newlyn</u> 2,992	<u>Brixham</u> 930					
1962	<u>Newlyn</u> 2,807	<u>Brixham</u> 558					
1965	<u>Newlyn</u> 1,189						
<u>Soles</u>							
1947 (foreign not included)	<u>Brixham</u> 2,332	<u>Ramsgate</u> 843	<u>Folkestone</u> 690	<u>Newhaven</u> 659	<u>Padstow</u> 606	<u>Plymouth</u> 569	<u>Hastings</u> 525
1950	<u>Brixham</u> 1,909	<u>Newlyn</u> 1,454	<u>Padstow</u> 1,220	<u>Folkestone</u> 731	<u>Plymouth</u> 481	<u>Newhaven</u> 468	<u>Hastings</u> 267
1953	<u>Newlyn</u> 1,399	<u>Brixham</u> 1,110	<u>Folkestone</u> 464	<u>Newhaven</u> 423	<u>Plymouth</u> 349	<u>Brighton</u> 241	<u>Dungeness</u> 175
1956	<u>Newlyn</u> 1,555	<u>Brixham</u> 763	<u>Brighton</u> 506	<u>Newhaven</u> 376	<u>Folkestone</u> 368	<u>Hastings</u> 307	<u>Plymouth</u> 247
1959	<u>Newlyn</u> 1,434	<u>Brixham</u> 903	<u>Hastings</u> 688	<u>Newhaven</u> 659	<u>Folkestone</u> 360	<u>Plymouth</u> 314	<u>Poole</u> 202
1962	<u>Newlyn</u> 1,676	<u>Brixham</u> 1,019	<u>Newhaven</u> 856	<u>Hastings</u> 521	<u>Plymouth</u> 352	<u>Folkestone</u> 278	<u>Poole</u> 212
1965	<u>Newlyn</u> 728	<u>Brixham</u> 721	<u>Hastings</u> 441	<u>Newhaven</u> 342	<u>Folkestone</u> 272	<u>Plymouth</u> 264	<u>Poole</u> 171

Source: 1. Mainly from Sea Fisheries Statistical Tables.

2. Some figures for 1947 and 1965 supplied by Statistics Department, Ministry of Agriculture, Fisheries and Food.

Note: The number of stations given under each heading varies according to the importance of the particular fish and the degree of detail available in the statistical sources used.

APPENDIX 3

Main Pelagic Fish and their Ports (including foreign landings)

(in cwts)

Pilchards

1947 (approx.)	Mevagissey 22,000	Looe 17,000	Plymouth 10,000	Newlyn 7,000	Porthleven 4,500	Polperro 2,500
1950	Newlyn 27,306	Looe 19,698	Plymouth 15,387	Mevagissey 10,589	Porthleven 3,281	Polperro 1,963
1953	Newlyn 38,868	Looe 25,746	Mevagissey 23,670	Plymouth 7,816	Polperro 6,079	Porthleven 1,899
1956	Newlyn 39,474	Looe 34,432	Mevagissey 26,525	Polperro 7,803	Plymouth 3,245	Porthleven 2,269
1959	Newlyn 27,073	Mevagissey 19,440	Looe 14,046	Polperro 4,735	Falmouth 1,116	
1962	Newlyn 16,161	Mevagissey 13,022	Looe 8,133	Polperro 1,193	Falmouth 526	
1965	Looe 10,144	Mevagissey 9,746	Newlyn 3,758	Falmouth 2,861		

Sprats

1947	Brixham 5,800	Torquay 3,127	Dungeness 1,619	Folkestone 1,110	Poole 560	
1950	Brixham 13,590	Poole 4,931	Torquay 3,849	Dungeness 3,425	Hythe 1,073	
1953	Whitstable 18,410	Torquay 15,052	Brixham 12,827	Poole 5,264	Dungeness 166	
1956	Whitstable 32,238	Brixham 10,025	Torquay 5,256	Poole 2,789	Dungeness 799	
1959	Torquay 10,725	Brixham 8,686	Whitstable 1,302	Dungeness 829	Poole 5	
1962	Brixham 16,443	Torquay 13,425	Whitstable 8,475	Dungeness 1,116	Poole 3,593	
1965	Poole 12,217	Torquay 12,054	Whitstable 12,007	Brixham 3,896	Teignmouth 3,825	

(continued)

APPENDIX 3 (continued)

Main Pelagic Fish and their Ports
(including foreign landings)
(in cwts)

Mackerel

1947	Mevagissey 2,960	Plymouth 853	Weymouth 297	Abbotsbury 203	Lympstone 198
1950	Newlyn 13,780	Mevagissey 1,920	Plymouth 1,000	Brixham 512	Brighton 314
1953	Newlyn 20,741	Mevagissey 3,143	St. Ives 761	Plymouth 560	Newhaven 551
1956	Newlyn 5,530	Mevagissey 2,370	St. Ives 1,124	Abbotsbury 1,063	Brixham 1,017
1959	Newlyn 10,456	St. Ives 2,530	Mevagissey 2,695	Brixham 1,189	Wyke 940
1962	Newlyn 15,084	Mevagissey 4,605	St. Ives 1,875	Penberth 1,809	Brixham 1,524
1965	Newlyn 11,204	Penberth 3,376	Mevagissey 3,109	St. Ives 2,639	Cadgwith 1,233

Herrings

1947	Torquay 822	Dungeness 415	Bognor 404	
1950	Dover 11,396	St. Ives 2,102	Dungeness 405	
1953	Dover 13,968	Dungeness 1,679	Hastings 508	
1956	Dover 1,438	Hastings 366	Torquay 330	
1959	Dungeness 1,126	Dover 554	Hastings 360	
1962	Newlyn 195	Hastings 125	Penberth 67	
1965	Dungeness 964	Hastings 442	Brixham 254	

Source: Sea Fisheries Statistical Tables and, for 1965, figures obtained from Statistics Department, Ministry of Agriculture, Fisheries and Food.

Note: The number of stations given under each heading varies according to the importance of the particular fish and the degree of detail available in the statistical sources used.

The greatest number of oysters is killed or lost from the grounds during the larval stage, but many are also destroyed subsequently.

The principal pests to post-larval oysters are tangles (or drills), starfish and slipper limpets. Tangles are marine snails which drill holes in the shells of oysters prior to eating the flesh. There are two principal types; the first is American whelk tangle, which was imported into the country in about 1920,¹ and presents a major problem on the east coast but has not been found in the south-west. Of lesser importance is the English rough tangle which, although common in the south-west, was exterminated from the grounds on the east coast by the hard winters of 1939/1940 and 1946/1947.² Mortality from drilling is high in oyster spat but as the shell thickens drilling diminishes and the death rate from this cause is low in oysters over two years of age.³

Starfish destroy many and, in particular, young oysters^{2,3} by eating the flesh after hunching their bodies over the closed shellfish. The method of destruction is in doubt but the oyster is consumed after its valves have been opened, perhaps solely by suction but perhaps with the aid of a poison secreted by the starfish and inhaled by the oyster.^{2,3}

The American slipper limpet is a pest in that, although it does not directly destroy oysters, it competes with them for space and food. This was also introduced from North America but probably earlier than the tangle.⁴ It is extremely dense in many areas, particularly in Essex,³ but is only occasionally found on Cornish grounds.⁴ It has been found that, where slipper limpets occur in large quantities, starfish may be of value by destroying these even greater pests.^{2,3}

In order to limit the spread of pests, restrictions were placed on the movement of shellfish by the Molluscan Shellfish (Control of Deposit) Order, 1965, Statutory Instrument No. 1971, which became operative from 1st January, 1966.

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1. Spotlight on the American Whelk Tangle. Laboratory Leaflet (New Series) No. 2. Ministry of Agriculture Fisheries and Food. 1962
 2. Oyster Cultivation in Britain. H.A. Cole. H.M.S.O. 1956
 3. Oysters. C.M. Yonge. Collins. 1960
 4. Protecting British Shellfisheries. Laboratory Leaflet (New Series) No. 10. Ministry of Agriculture, Fisheries and Food. 1966

APPENDIX 5Distribution of landings of Larger CrustaceansCrabs (in 000's before 1955, 00 cwt post and including 1955)

<u>1946</u>	<u>1949</u>	<u>1952</u>	<u>1955</u>	<u>1958</u>	<u>1961</u>	<u>1964</u>
Hallsands & Beesands 311.1	Hallsands, Beesands & Salcombe 275.9	Hallsands, Beesands & Salcombe 242.1	Hallsands & Beesands 56.2	Hallsands & Beesands 53.4	Dartmouth & Kingswear 45.8	Hallsands & Beesands 29.1
Porthleven 110.5	Dartmouth 103.8	Dartmouth 136.9	Dartmouth 36.3	Dartmouth 39.1	Hallsands & Beesands 33.9	Dartmouth 24.0
Loe 33.9	Porthleven 62.2	Wyke and Portland 18.9	Wyke 9.4	Plymouth 17.8	Plymouth 12.9	Plymouth 18.3
Cadgwith 31.8	Brixham 32.6	Porthleven 16.7	Coverack 3.9	Porthleven 10.5	Porthleven 9.2	Porthleven 10.0
Newlyn 25.4	Poole 22.7	Cadgwith 15.4	Selsey 3.6	Wyke 9.1	Newlyn 6.7	Newlyn 5.7
Portloe 21.1	Seaton 21.0	Plymouth 10.1	Cadgwith 3.3	Cadgwith 6.2	Cadgwith 6.3	Cadgwith 5.4
Seaton 18.5	Plymouth 20.5	Selsey 9.8	Portloe 3.2	Newlyn 5.5	Wyke 6.3	Wyke 5.4
Gorran 18.0	Portloe 17.8	Budleigh 9.2	Plymouth 3.1	Hope Cove 3.5	Coverack 4.8	Weymouth 3.5
Plymouth 15.6	Newlyn 16.3	Mullion 9.0	Mullion 2.9	Mevagissey 3.4	Portloe 3.4	Falmouth 3.1
Polperro 14.8	Beer 16.0	Seaton 8.2	Mevagissey 2.2	Portloe 3.3	Brixham 3.1	Newquay 3.0
	Cadgwith 16.0		Gorran 2.2			
Others 123.5	153.9	71.8	24.7	28.2	17.2	27.8
Total 724.2	758.7	562.3	151	178	149.6	135.3

(continued)

APPENDIX 5 (continued)Distribution of landings of Larger CrustaceansLobsters (in 000's before 1955, 00 cwt post and including 1955)

<u>1946</u>		<u>1949</u>		<u>1952</u>		<u>1955</u>		<u>1958</u>		<u>1961</u>		<u>1964</u>	
St. Ives	31.3	St. Ives	32.2	Plymouth	15.9	Port Isaac	3.5	Port Isaac	2.4	Weymouth	2.9	Newquay	3.4
Looe	26.5	Beer	28.5	St. Ives	12.9	Selsey	2.7	Weymouth	2.1	Selsey	2.5	Port Isaac	2.4
Porthleven	23.1	Seaton	19.1	Looe	11.8	I. of W.	2.5	Selsey	2.0	Wyke and	2.3	Hayle	1.9
Portloe	18.5	Porthleven	18.3	Seaton	11.0	Wyke	2.1	Plymouth	2.0	Portland Poole	1.8	Weymouth	1.8
Port Isaac	15.5	Looe	16.2	Eastbourne	10.9	Portloe	1.9	Wyke	1.9	Port Isaac	1.8	Selsey	1.7
Seaton	15.2	Poole	14.6	Port Isaac	10.8	Sennen	1.7	I. of W.	1.6	I. of W.	1.4	St. Ives	1.5
Gorran	11.9	Eastbourne	14.3	Budleigh	10.7	Scillies	1.5	Beer	1.4	Plymouth	1.4	Wyke	1.4
Polperro	11.7	Plymouth	14.1	Margate	8.4	Plymouth	1.5	Sennen	1.2	Swanage	1.2	Plymouth	1.3
Plymouth	10.8	Kimmeridge & Chapman's Pool	11.6	Scillies	8.3	Poole	1.4	Eastbourne	1.1	Dartmouth	1.0	Swanage	1.3
Weymouth	9.3	Weymouth	10.8	Portloe	8.1	Cadgwith	1.3	Seaton	1.1	Padstow	0.8	I. of W.	1.0
						Kimmeridge & Chapman's Pool	1.3			Eastbourne	0.8	Poole	1.0
										Beer	0.8		
Others	134.9		144.7		83.9		13.6		11.2		6.4		8.6
Total	308.7		324.4		201.1		35		28		25.1		26.0

(continued)

APPENDIX 5 (continued)

Distribution of landings of Larger CrustaceansCrawfish (in 000's before 1955, 00 cwt post and including 1955)

<u>1946</u>		<u>1949</u>		<u>1952</u>		<u>1955</u>		<u>1958</u>		<u>1961</u>		<u>1964</u>	
St. Ives	7.9	St. Ives	11.4	St. Ives	7.8	Cadgwith	1.6	Porthleven	1.5	Scillies	1.0	Newquay	5.0
Porthleven	7.2	Scillies	10.0	Cadgwith	4.2	Sennen	1.0	Scillies	1.2	Newlyn	0.6	Hayle	3.5
Scillies	4.4	Porthleven	9.3	Porthleven	3.5	Mullion	0.7	Cadgwith	1.1	Porthleven	0.5	Padstow	1.8
Cadgwith	2.5	Sennen Cove	5.4	Mullion	3.4	St. Ives	0.6	Sennen	0.8	Cadgwith	0.5	St. Ives	1.6
Sennen Cove	1.0	Cadgwith	5.0	Sennen	2.7	Porthleven	0.5	Newlyn	0.7	Mullion	0.3	Newlyn	1.2
Mullion	0.7	Mullion	2.6	Porthgwarra	0.5	Newlyn	0.4	Mullion	0.5	Sennen	0.3	Scillies	0.7
Newquay	0.7	Porthgwarra	1.0	Newlyn	0.5	Scillies	0.3	St. Ives	0.2	Padstow	0.3	Cadgwith	0.4
Others	2.1		2.6		1.5		0.6		0.1		0.3		2.1
Total	26.5		47.3		24.1		5.7		6.1		3.8		16.3

Source: Figures supplied by Statistics Department, Ministry of Agriculture, Fisheries and Food.